INSULATION GUIDELINES

Code Checklist for Designers - Stretch Code

Alterations, Renovations, or Repairs – HERS rating of ≤ 85 for house < 2000 ft2, HERS rating of ≤ 80 for house ≥ 2000 ft2, OR the following in all exposed or new areas Get a HERS rating. **OR** the follow this prescriptive list
Category Verification Source

☐ **Insulation**

- Roof or joists of unfinished attic - R-38, unless the existing rafters aren't deep enough, then R 3.5/inch. This MAY be triggered even if you just expose the sheathing. on plans, inspection, IECC 2009 402.1.1 (we're zone 5A), MA Bld Code 8th Ed. 115AA 101.4.3
- EXCEPTION – up to 500 ft2 or 20%, whichever is less, of roof can be R-30 IECC 2009 402.2.2
- Existing walls - fill full with R 3.5/inch material. New walls R-20. Use either 2x6 frame or 2x4 frame with 2" of rigid. on plans, inspection IECC 2009 402.1.1, MA Bld Code 8th Ed. 115AA 101.4.3
- Floors R-30, existing floors R 3.5/inch on plans, inspection IECC 2009 402.1.1
- Basement wall R-10 on the foundation wall, or R-13 in a framed wall on plans, inspection IECC 2009 402.1.1
- Slab R-10, slab perimeter R-10 on plans, inspection IECC 2009 402.1.1
- Craw space wall R-10 on plans, inspection IECC 2009 402.1.1
- Mass walls (concrete/masonry) R-13 if >50% of insulation is outside wall R-17 if <50% of insulation is outside wall on plans, inspection IECC 2009 402.1.1
- **For additions** all U-values must meet IECC 2009 standards. No R-3.5/inch exception for exisicng voids. on plans, inspection See Renovation section, above

☐ **Fenestration:**

- windows U-.30 or lower, doors: soid U.21 or lower, less than ⅓ glass U.27 or lower, more than ⅓ glass U.32 or lower; skylights U.55 or lower. Doors/hatches to uncconditioned space must be gasketed + insulated., so avoid uninsulated space. windowdoor paperwork or copies of labels MA Bld Code 8th Ed 115AA 401.3, Energy Star windowdoor V.5, IECC 2009 402.2.3
- Up to 15 ft2 of "glazed fenestration" can be exempt from U- factor requirements IECC 2009 402.3.3 IECC 2009 o Ore opaque (no glass), side-hinged door, up to 24 ft2, can be exempt from U-factor requirements IECC 2009 402.3.4 IECC 2009

☐ **Air seals –**

- all joints, seams, and penetrations between conctioned + unconditioned space to create continuous barrier. If tested must meet < 7 ACH 50 Blower door, or Energy Star thermal bypass checklist by contractor IECC 2009 402.4.2, 402.4.1 MA Bld Code 8th Ed. Appendix 115AA 401.3

☐ **Lighting**

- Cans in roofs or unconditioned space - IC rated and caulked or gasketed to finish surface inspection IECC 2009 402.4.5
- At least 80% of new lights must be high-efficiency on plans, inspection IECC 2009 404.1

☐ **HVAC**

- Equipmant sized using Manuals J, S and D. Do not oversize IECC 2009 403.6, IRC 1401.3

☐ **Labeling –**

- 401.3 Compliance checklist on plans. inspection IECC 103.1

2 FAMILY RESIDENCE

143 LINCOLN STREET, NEWTON HIGHLANDS, MA 02461

SEE NEPONSET VALLEY SURVEY ASSOC. INC.
CURRENT SURVEY PLAN

SITE PLAN

NTS

143 LINCOLN STREET, NEWTON HIGHLANDS, MA 02461

LEGEND

EXISTING WALLS TO REMAIN

EXISTING WALLS/CONSTRUCTION TO BE REMOVED

NEW WALLS

(N) NEW

(E) EXISTING

Detail No. / Drawing No. — BUILDING SECTION

Detail No. / Drawing No. — DETAIL SECTION

— PARTITION TYPE

— NEW DOOR & DOOR NUMBER

— WINDOW NUMBER

Drawing No. / # / # / Elevation No. — INTERIOR ELEVATION

ABBREVIATIONS

AL	Aluminum
APPROX	Approximately
BD	Board
BLDG	Building
CLG	Ceiling
CLR	Clear
COL	Column
CONC	Concrete
CONSTR	Construction
CONT	Continuous
CPT	Carpet
CT	Ceramic Tile
CTR	Center
DET	Detail
DIA	Diameter
DISP	Dispenser
DN	Down
DWG	Drawing
ELEC	Electric(Electrical)
EQ	Equal
ETR	Existing to Remain
EXIST	Existing
FFL	Finish Floor
GA	Gauge
GL	Glass
GWB	Gypsum Wall Board
HCP	Handicapped
HDP	High Density Polymer
HR	Hour
HT	Height
INSUL	Insulation(Insulated)
LT	Light
MAX	Maximum
MECH	Mechanical
MIN	Minimum
MISC	Miscellaneous
NIC	Not In Contract
NTS	Not To Scale
OPP	Opposite
P.LAM	Plastic Laminate
PL	Plaster
PTD	Painted
REQ	Required
RO	Rough Opening
SIM	Similar
SST	Stainless Steel
STD	Standard
STL	Steel
STOR	Storage
SUSP	Suspended
T&G	Tongue & Groove
THK	Thick
TYP	Typical
VCB	Vinyl Cove Base
VPB	Veneer Plaster Base
WC	Water closet
WD	Wood
W/	With
W/O	Without
WT	Weight

LIST OF DRAWINGS

Architect:
Ronald F. Jarek

487 Watertown Street
Newtonville, MA 02460
(617) 818-4540

COMPLETION OF DOCUMENTS (WITH PERMISSION) ORIGINALLY SUBMITTED BY DEMARCO & ASSOCIATES, ARCHITECTS AND PLANNERS, 14 FRONT STREEF, SALEM, MA

REGISTERED ARCHITECT RONALD F. JAREK No. 4653 NEWTON, MASS. COMMONWEALTH OF MASSACHUSETTS

STAMP:

TITLE & DRAWINGS LIST

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461
CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014
SCALE: AS NOTED
DRAWN BY: N.G.H
CHECKED BY: R.J
REV. DATE: 9-9-2014 10-9-2014

A-0

ORIGINAL PLANS WERE DESIGNED BY CHARLES DEMARCO, ARCHITECT, DEMARCO ASSOCIATES. COMPLETION OF CONSTRUCTION PLANS BY RONALD F. JAREK, ARCHITECT.

GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE COMMONWEALTH OF MASSACHUSETTS STATE BUILDING CODE, THE REQUIREMENTS OF THE CITY OF NEWTON, THE OCCUPATIONAL SAFETY AND HEALTH STANDARDS AND ALL OTHER APPLICABLE REGULATIONS, LAWS, ORDINANCES, ETC. GOVERNING THIS WORK INCLUDING HERS RATINGS.
2. PRIOR TO SUBMITTING BID, CONTRACTOR MUST THOROUGHLY EXAMINE THE DRAWINGS, AND INSPECT THE BUILDING TO FULLY UNDERSTAND THE FACILITY, DIFFICULTIES AND RESTRICTIONS AFFECTING THE EXECUTION OF THE WORK UNDER THIS CONTRACT. THE FAILURE OF THE CONTRACTOR TO RECEIVE OR EXAMINE ANY FORM OF INSTRUMENT OR DOCUMENT OR TO VISIT THE SITE SHALL IN NO WAY RELIEVE ANY OBLIGATION WITH RESPECT TO THIS WORK. NO CLAIMS FOR ANY ADDITIONAL COST WILL BE ALLOWED DUE TO LACK OF FULL KNOWLEDGE OF EXISTING CONDITIONS.
3. CONTRACTOR'S BID PRICE SHALL REFLECT ALL SPECIFIED WORK.
4. DRAWN INFORMATION IS TAKEN FROM EXISTING CONDITIONS AND RANDOM FIELD MEASUREMENTS AND IS PROVIDED ONLY TO ASSIST THE CONTRACTOR IN ESTABLISHING THE SCOPE OF WORK.
5. ALL EXISTING CONDITIONS AND PLAN AND DETAIL DIMENSIONS SHOULD BE VERIFIED IN THE FIELD PRIOR TO COMMENCING THE WORK. THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY DISCREPANCIES FOUND IN THE PLANS OR SPECIFICATIONS BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.
6. DO NOT SCALE THESE DRAWINGS FOR QUANTITIES, LENGTHS, SIZES, AREAS ETC.
7. IT IS NOT INTENDED THAT THESE DRAWINGS SHOW EVERY CUT, CONDITION ETC. OF THIS SYSTEM, HOWEVER, THE CONTRACTOR SHALL FURNISH A COMPLETE PRODUCT IN ACCORDANCE WITH THE BEST PRACTICE OF THE TRADE TO THE SATISFACTION OF THE ARCHITECT AND THE OWNER, AND IN STRICT CONFORMANCE WITH ALL APPLICABLE LOCAL AND STATE BUILDING CODE REGULATIONS.

8. CONTRACTOR SHALL REPAIR ALL AREAS DAMAGED BY DEMOLITION PRIOR TO INSTALLATION OF NEW MATERIAL.

9. IF HAZARDOUS WASTE IS ENCOUNTERED, STOP WORK & CONTACT THE OWNER & ARCHITECT IMMEDIATELY TO INITIATE ABATEMENT PROCEDURES IN ACCORDANCE WITH DHCD STANDARDS.

GENERAL NOTES STRUCTURAL

1. ALL WORK SHALL COMPLY WITH THE STATE OF MASSACHUSETTS BUILDING CODE, REQUIREMENTS OF THE CITY OF NEWTON, AND ALL OTHER LOCAL, STATE AND FEDERAL STANDARDS AND REGULATIONS.
2. DO NOT SCALE THIS DRAWING. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS, LIMITS AND LOCATIONS REGARDING LAYOUT OF ALL STRUCTURAL FRAMING MEMBERS AND COMPONENTS. REFER TO ARCH. DWGS. FOR ALL ELEVATIONS.
3. THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS AND THESE DRAWINGS SHALL BE REFERED TO FOR SIZE AND LOCATION OF APPURTENANCES.
4. DIMENSIONS SHOWN ON THE DRAWINGS MUST BE COORDINATED WITH ARCHITECTURAL DRAWINGS PRIOR TO DETAILING, FABRICATION AND ERECTION OF ALL STRUCTURAL MEMBERS.
5. EXISTING LAYOUT, ITEMS AND CONDITIONS MAY DIFFER FROM AS SHOWN. ALL EXISTING CONDITIONS AND DIMENSIONS MUST BE VERIFIED IN FIELD PRIOR TO COMMENCING THE WORK. ANY DISCREPENCIES FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.
6. IT IS THE BIDDER'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS AT THE SITE PRIOR TO BIDDING. FAILURE TO SO EXAMINE THE SITE AND THE CONTRACT DOCUMENTS WILL NOT RELIEVE THE BIDDER FROM ANY OBLIGATION UNDER THE BID AS SUBMITTED.
7. FABRICATOR FOR EACH STRUCTURAL TRADE SHALL PREPARE SHOP DRAWINGS SHOWING LOCATION, LIMITS, DIMENSIONS AND EXTENT OF ALL MEMBERS, CONNECTIONS AND DETAILS TO BE SUBMITTED FOR APPROVAL. NO ERECTION SHALL BE PERFORMED WITHOUT THE APPROVAL OF SHOP DRAWINGS.
8. THE CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS AT ALL TIMES TO PROTECT ADJOINING PROPERTY FROM DAMAGE. ALL ABUTTING WORK SHALL BE RESTORED TO PRESENT CONDITION.
9. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL ITEMS FOR APPROVAL.

FOUNDATION NOTES

1. FOOTINGS SHALL BE CARRIED TO ELEVATIONS SHOWN ON THE DRAWINGS AND DEEPER IF NECESSARY TO OBTAIN A SAFE BEARING PRESSURE OF AT LEAST 2000 POUNDS PER SQUARE FOOT. CONTRACTOR SHALL VERIFY THE DESIGN BEARING CAPACITY THROUGH GEOTECHNICAL SERVICES PRIOR TO PLACING CONCRETE AND AFTER PLACEMENT HAS BEEN APPROVED.
2. NO FOUNDATIONS SHALL BE PLACED ON FROZEN SOIL OR WATER. PROVIDE PROPER DRAINAGE OF EXCAVATION WITH PLASTIC PIPE TO PROTECT AGAINST WATER. WHERE IT IS NECESSARY TO RAISE THE GRADE BELOW SLAB DUE TO OVER EXCAVATION, STRUCTURAL FILL SHALL BE PLACED AND COMPACTED TO 95% DRY DENSITY.
3. PROVIDE PROPER DRAINAGE OF EXCAVATION OR COVER EXCAVATION WITH PLASTIC TO PROTECT AGAINST WATER.

PLYWOOD NOTES

1. ALL PLYWOOD SHEATHING SHALL BE APA RATED STRUCTURAL I. PLYWOOD USED FOR ROOF SHEATHING SHALL BE EXTERIOR GRADE.
2. ALL PLYWOOD SHALL HAVE A MINIMUM THICKNESS OF 3/4".
2. ALL EDGES SHALL BE TONGUE AND GROOVE JOINTED OR CONTINUOUSLY SUPPORTED WITH WOOD BLOCKING.

CONCRETE NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF AMERICAN CONCRETE INSTITUTE'S ACI 318 (BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE). CONCRETING SHALL FOLLOW REQUIREMENTS OF ACI 306 R FOR COLD WEATHER CURING AND ACI 305 R FOR HOT WEATHER CURING.
2. CONCRETE STRENGTH SHALL BE AS FOLLOWS: ALL CONCRETE – MIN. COMPRESSIVE STRENGTH = 4000 PSI
3. ALL BAR REINFORCEMENT SHALL CONFORM TO ASTM A615 – GRADE 60.
4. ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 AND SHALL BE SUPPLIED IN FLAT SHEETS. WELDED WIRE FABRIC SHALL BE 6x6–W4xW4 UNLESS NOTED.
5. MINIMUM CONCRETE CLEARANCES FOR PROTECTION OF REINFORCING:
   SLABS: TOP – 2"
   WALL: ALL SIDES – 2" (MIN.)
6. ALL EXPOSED CONCRETE EDGES SHALL HAVE 3/4" CHAMFER, USING EDGING TOOL WHERE NEEDED. EXPOSED CONCRETE SURFACES SHALL HAVE A PLYWOOD FINISH. JOINTS AND FINS SHALL BE SACKED TO A UNIFORM TEXTURE WHILE CONCRETE IS STILL GREEN, TO PRODUCE A SURFACE ACCEPTABLE TO THE DESIGNERS & OWNER.
7. CONSTRUCTION JOINT SPACING SHALL BE AS SHOWN ON THE DRAWINGS.
8. BONDING AGENT FOR ADHERING NEW CONCRETE TO EXISTING CONCRETE SHALL BE APPLIED PRIOR TO POURING NEW CONCRETE. BONDING AGENT SHALL BE "WELDCRETE" AS MANUFACTURED BY LARSEN PRODUCTS CORP. OF ROCKVILLE, MD, OR APPROVED EQUAL.
9. DOWELLING OF NEW REINFORCEMENT INTO EXISTING CONCRETE SHALL BE ACHIEVED BY USING THE HILTI HVA "ADHESIVE ANCHOR METHOD". ALL INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS.
10. CONTROL JOINTS SHALL BE PLACED THROUGHOUT AND EQUALLY SPACED NOT EXCEEDING 10' ON CENTER, IN ANY DIRECTION.

WOOD NOTES

1. ALL STRUCTURAL WOODWORK, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION'S SPECIFICATION FOR DESIGN, FABRICATION AND ERECTION OF WOOD STRUCTURES.
2. ALL STRUCTURAL LUMBER SHALL BE SOUTHERN PINE, DOUGLAS FIR, GRADE 1 OR APPROVED EQUAL WITH MINIMUM PROPERTIES OF: E = 1,800,000 PSI, Fb = 1500 PSI, Fv = 190 PSI.

NOTE – DIMENSION

ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING DIMENSIONS AND PREPARE A LAYOUT DRAWING WITH ALL EXISTING CONDITION PRIOR TO PROCEEDING WITH ANY NEW WORK.

PRODUCTS

- SEE ATTACHED MATERIALS LIST FOR PRODUCTS AND/OR FINISHES

EXTERIOR MATERIALS LIST:
143 Lincoln St., Newton Highlands, MA 02461

ROOF:
- 30 year Fiberglass Asphalt Shingles
- Corrugated (black) Ridge Vent
- Black Vent Pipes
- Natural Heating Exhaust Stacks (flush style)

TRIM
- Azek or equal Rake, Cornice, Frieze, Water-table, Belt, Brackets, Dentals, Corner and/or Running Trim

SIDING
- Hardie Plank or equal, 4.5" to weather, texture side out and/or Match Existing
- Synthetic Scalloped Shingles at Pediments (2)
- Painted MDO Plywood at Pediments
- Azek or equal Direct Vent Exhaust Block Outs, Lighting Block outs
- Painted Side-wall Vents (Dryer, Exhaust Fans) through Azek or equal Blocks outs

DOWN SPOUTS AND GUTTERS
- Baked on Color Finish, Aluminum Box Trough Style w/ Round Leaders and Fittings

WINDOWS
- Marvin or equal Insulated Glass, Simulated 2 over 1 Divided Lites and Ovals

DOORS
- Synthetic Panel Entry Units with Vision Lites and/or Simulated Divided Side Lites
- Synthetic Panel Style Garage Doors

COLUMNS
- Azek or equal Square field built Columns, Plinth and Capital

PORCH, DECK and STEPS
- Trex or equal Porch, Deck and Stair Treads
- Azek or equal Risers and Stringers
- Synthetic Balustrade and Square field built Newel Posts

LIGHTING
- Wall Mounted Lantern Style

HARDWARE
- Stainless Steel Lever or Thumb Latch Style
- Mail Boxes Stainless Steel
- House Numbers Stainless Steel

WALKS
- Modular Pavers at Entry Points

DRIVEYAY
- Bituminous

SQUARE FEET CALCULATION

FAR / SQ. FT. CALCULATIONS–LOT SIZE 11,775 sf						
AREA	UNIT "A"		UNIT "B"		TOTAL S.F. ALLOWED @	TOTAL S.F. PROVIDED @ 0.49.6 FAR
	S.F	NOT INCLUDED IN FAR	S.F	NOT INCLUDED IN FAR		
BASEMENT		** 1262 SF.		**327 SF.		
GARAGE PER X/Y	** 232.5 SF.		** CARPORT			
FIRST FLOOR	**1,468 SF.		**964 SF.			
SECOND FLOOR	**1,338 SF.		**1078 SF.			
INTERSTITIAL SPACE		** 000.00 SF.				
PORCH/DECK		** 454 SF.		** 290 SF.		
ATTIC FLOOR AREA FROM 7'–0" HIGH	** 000.0 SF. LESS THAN 7'		** 759 SF.			
TOTAL SQ. FT.	**3,038.5 SF.		**2,801 SF.			**5,839.5 SF.

* INCLUDES 1 1/2" SHEATHING AND SIDING THICKNESS
** DOES NOT INCLUDE 1 1/2" SHEATHING AND SIDING THICKNESS

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

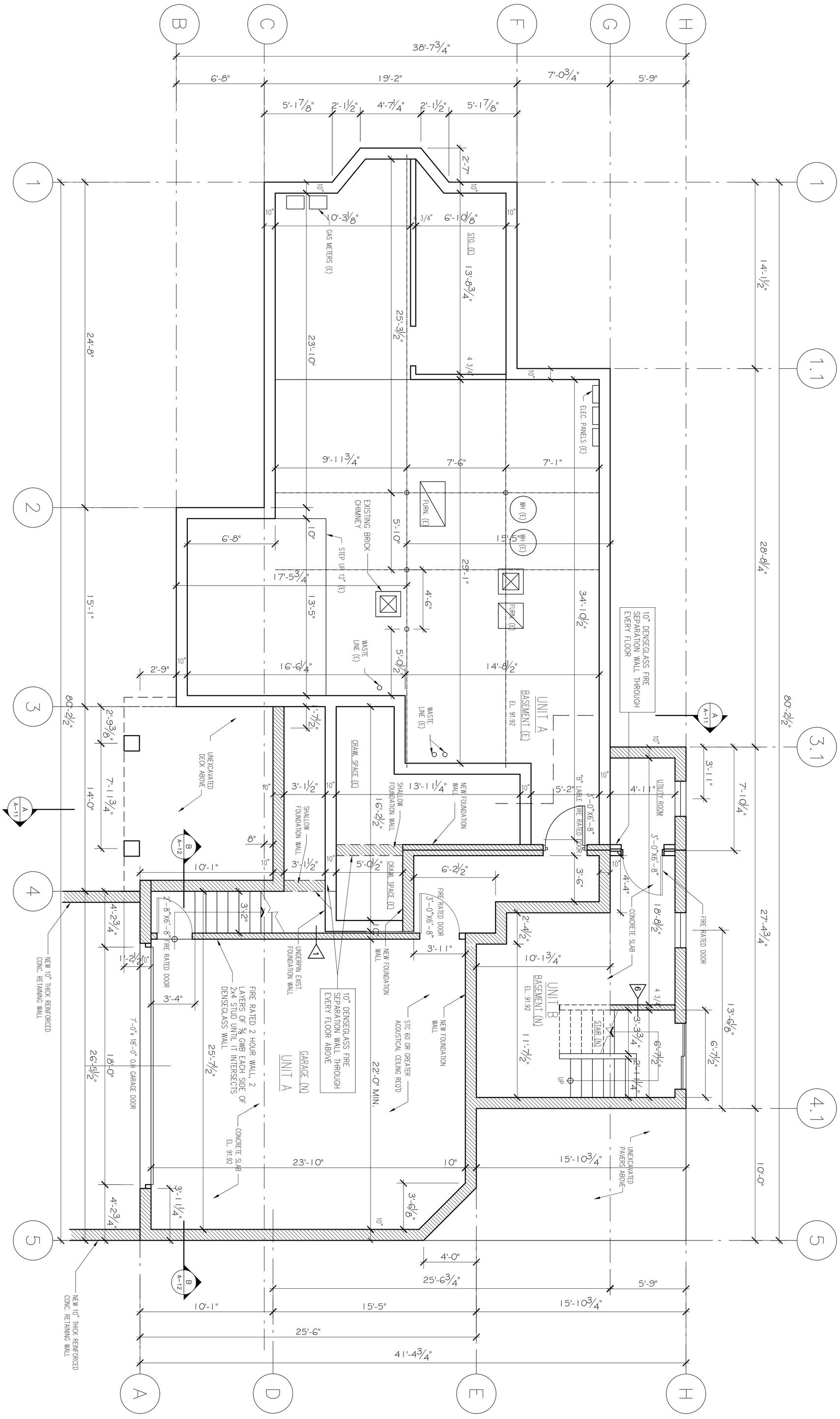
NOTES, FAR & MATERIALS

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

STAMP: REGISTERED ARCHITECT RONALD F. JAREK No. 4653 NEWTON, MASS. COMMONWEALTH OF MASSACHUSETTS

DATE: AUGUST 01, 2014
SCALE: AS NOTED
DRAWN BY: N.G.H
CHECKED BY: R.J
REV.: 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

A-1



PROPOSED BASEMENT PLAN

1/4" = 1'-0"

A-2

DATE:	AUGUST 03, 2014
SCALE:	AS NOTED
DRAWN BY:	N.G.H
CHECKED BY:	R.J
REV.:	6-6-2014
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Ronald F. Jarek, Architect

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CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

PROPOSED BASEMENT FLOOR PLAN

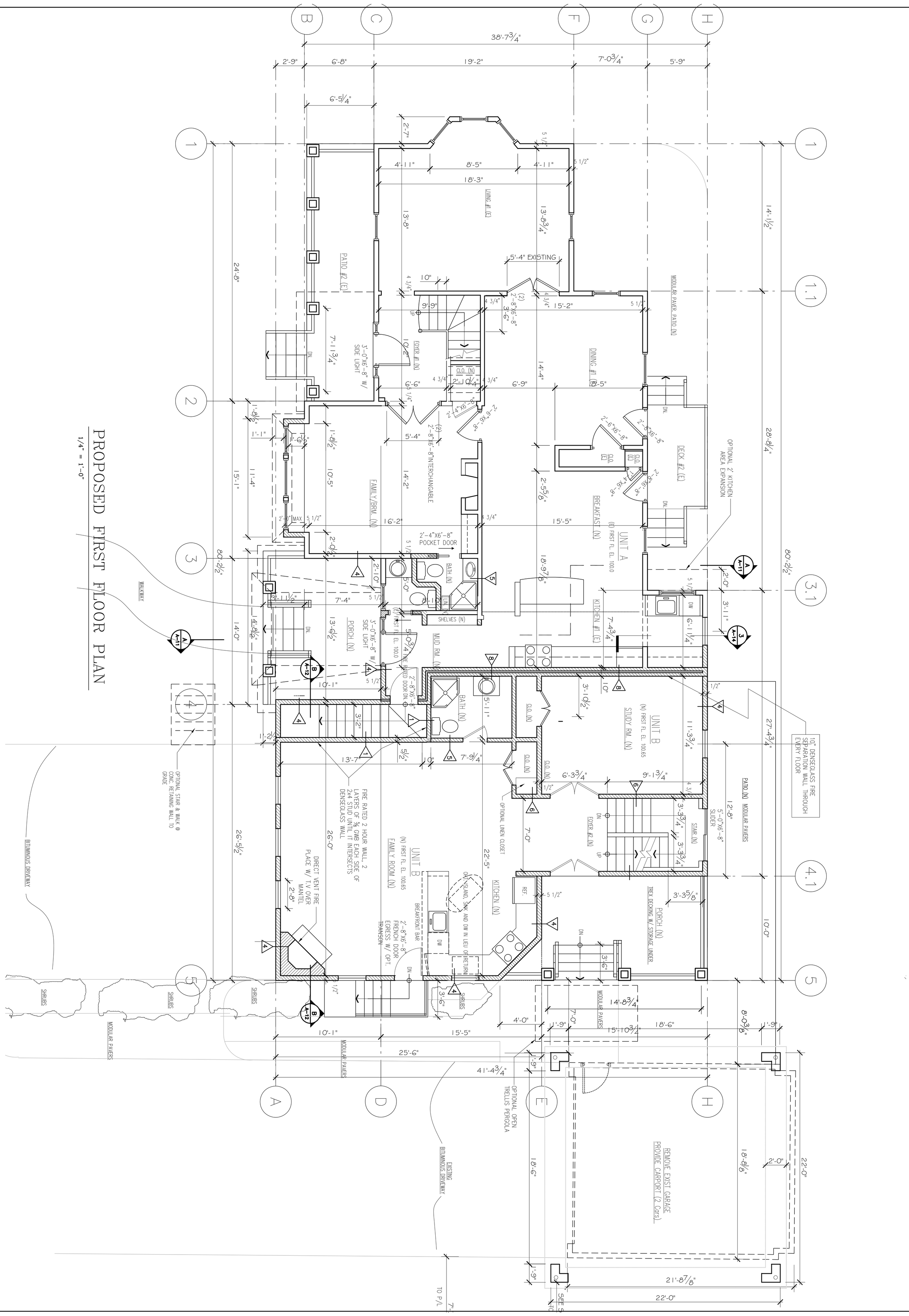
143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

STAMP:

COMMONWEALTH OF MASSACHUSETTS
REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.

PROPOSED FIRST FLOOR PLAN

1/4" = 1'-0"



Ronald F. Jarek, Architect

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Newtonville, MA 02460

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2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

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79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

PROPOSED FIRST FLOOR PLAN

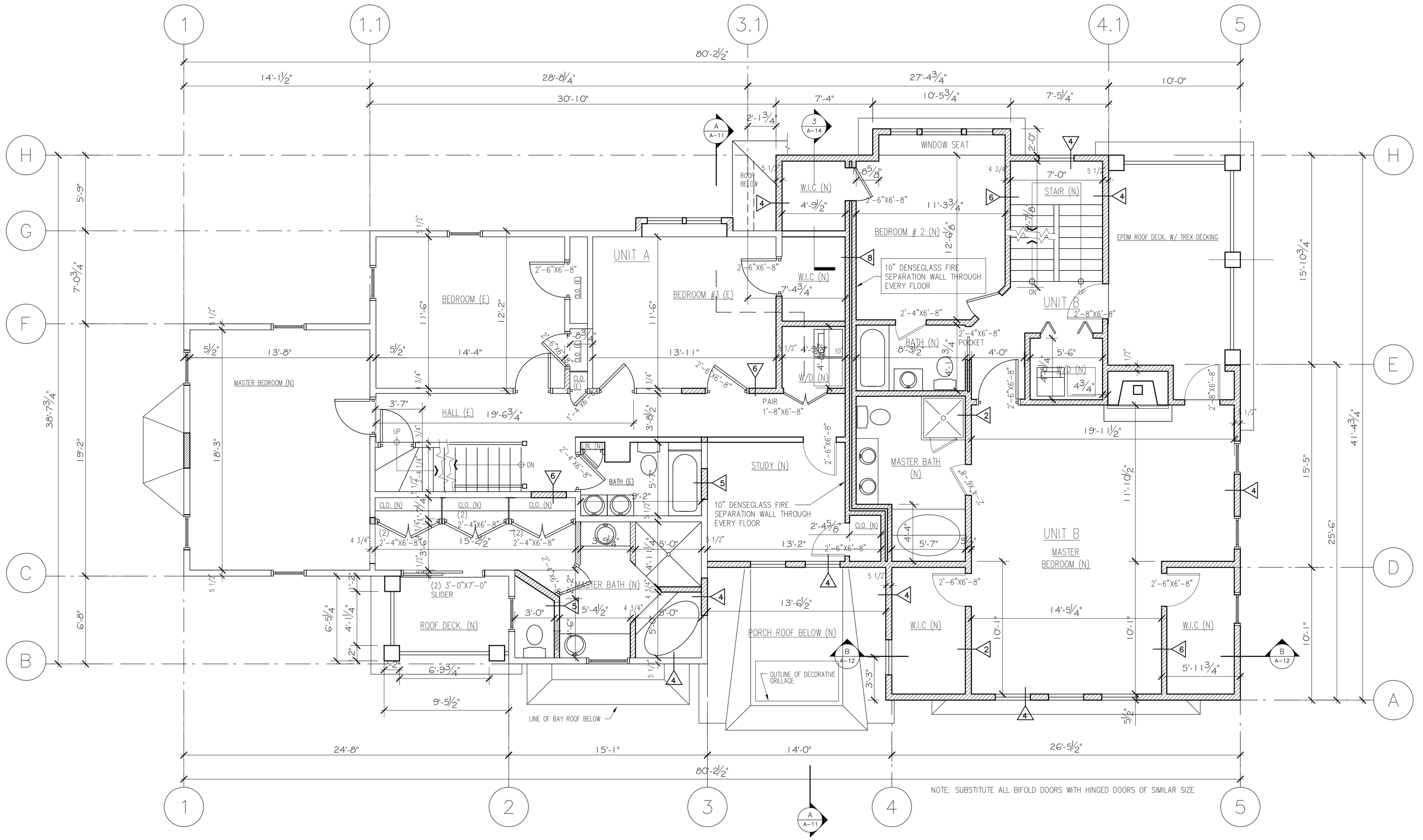
143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

A-3

DATE: AUGUST 03, 2014
SCALE: AS NOTED
DRAWN BY: N.G.H
CHECKED BY: R.J
REV: 9-6-2014
REV DATE: 9-9-2014
10-9-2014

STAMP:

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS



PROPOSED SECOND FLOOR PLAN

1/4" = 1'-0"

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED SECOND FLOOR PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

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Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014

SCALE: AS NOTED

DRAWN BY: N.G.H

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REV.: 6-6-2014
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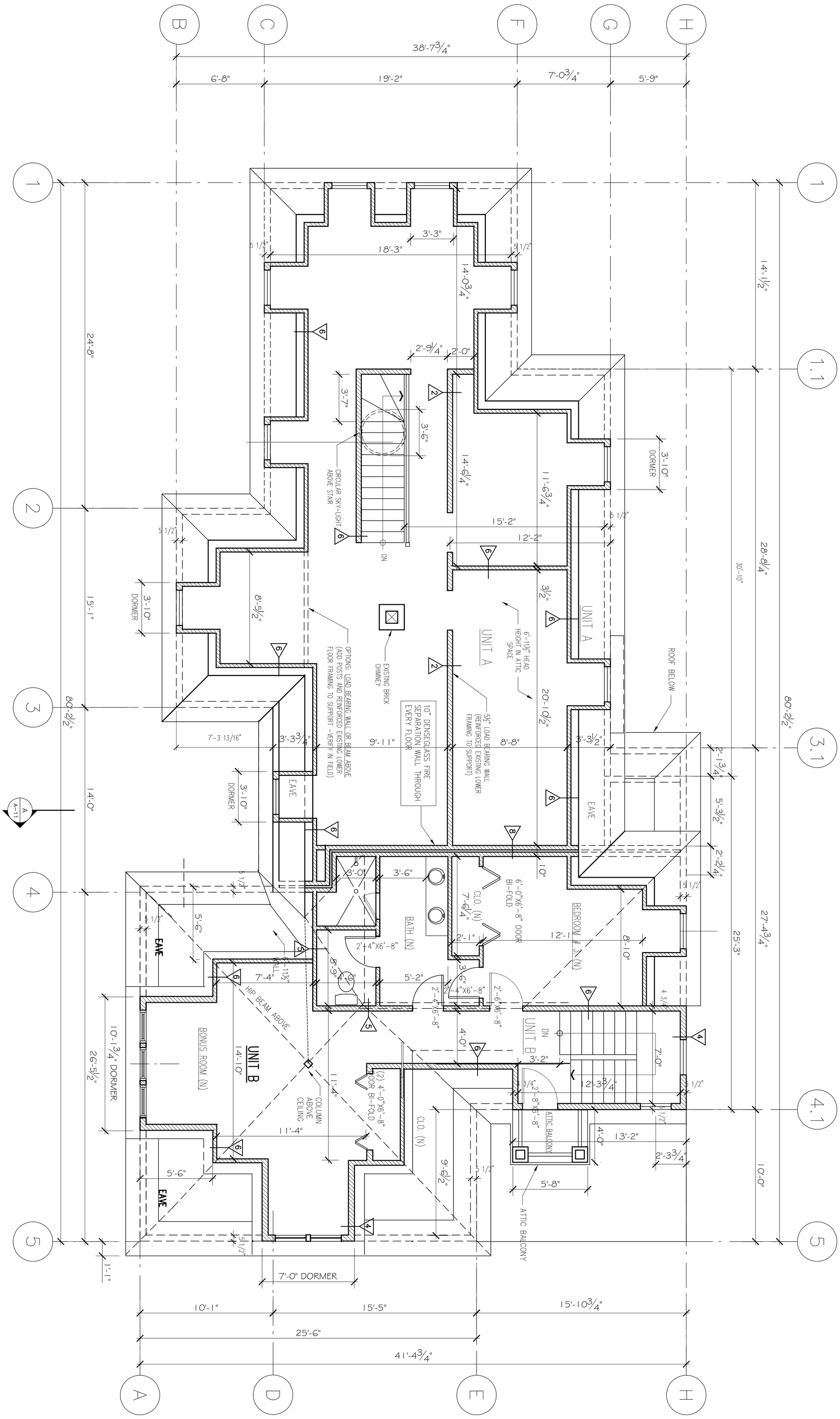
10-9-2014

A-4



PROPOSED ATTIC FLOOR PLAN

1/4" = 1'-0"

A-5

DATE:	AUGUST 6, 2014
SCALE:	AS NOTED
DRAWN BY:	N.G.H
CHECKED BY:	R.J
REV:	9-6-2014
REV: DATE:	9-9-2014
	10-9-2014

Ronald F. Jarek, Architect

487 Watertown Street
Newtonville, MA 02460

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2 FAMILY RESIDENCE - 143 LINCOLN STREET,
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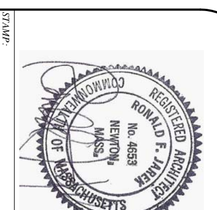
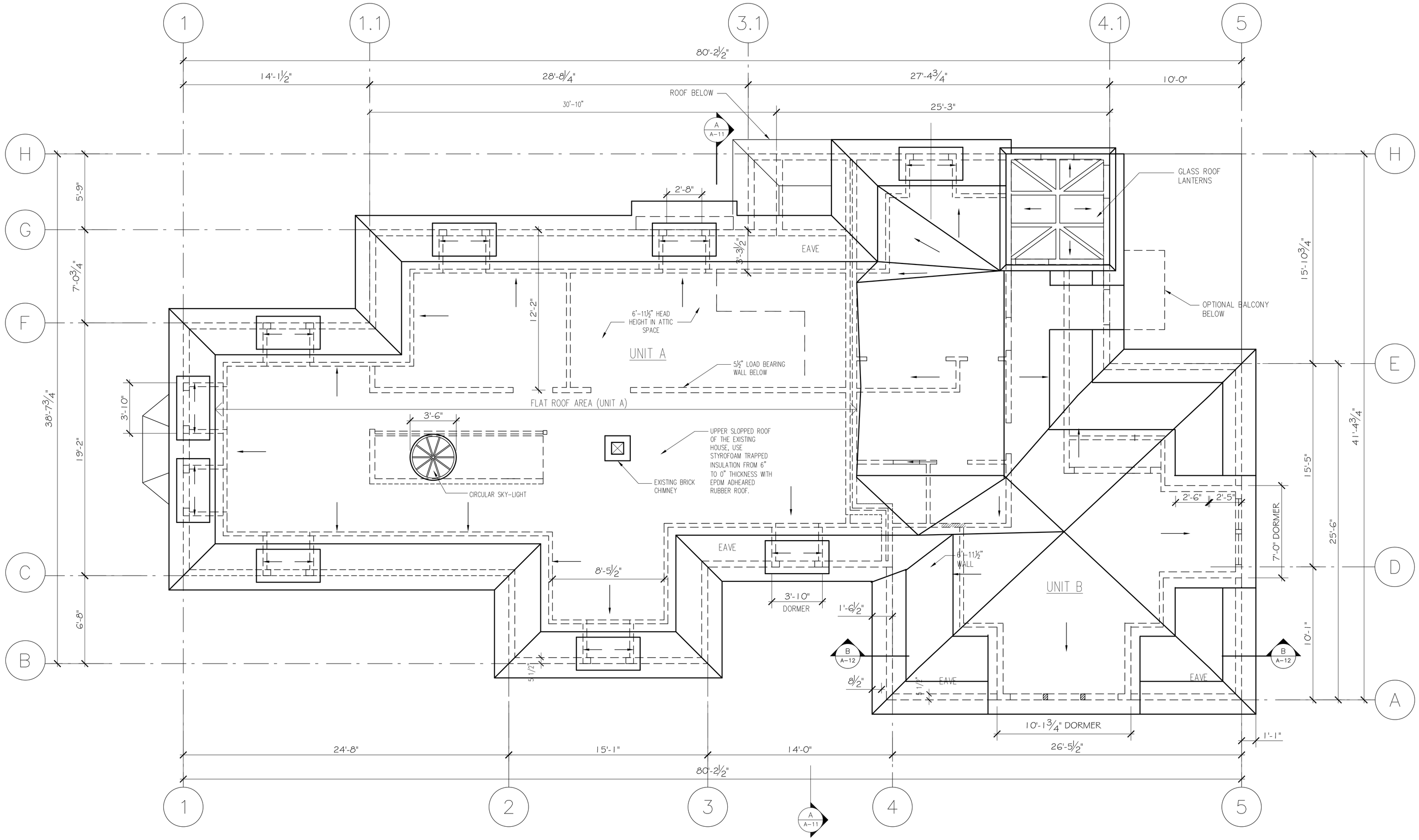
NEWTON CENTER, MA 02459

PROPOSED ATTIC FLOOR PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

STAMP:





PROPOSED ROOF PLAN

1/4" = 1'-0"

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED ROOF PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

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Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014

SCALE: AS NOTED

DRAWN BY: N.G.H

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REV: 8-6-2014
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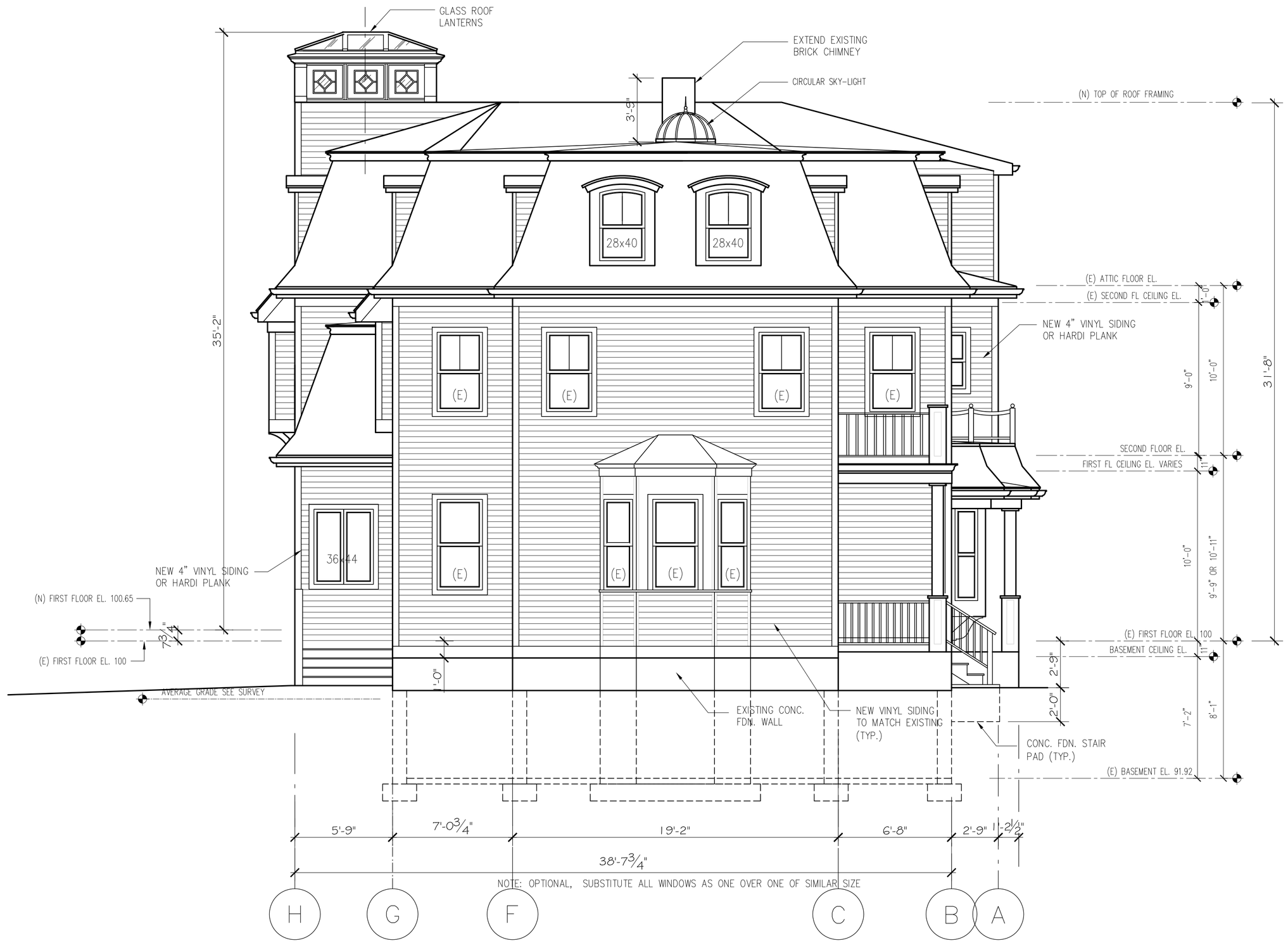
10-9-2014

A-6



PROPOSED FRONT ELEVATION (SOUTH)

1/4" = 1'-0"

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED REAR ELEVATION

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DATE: AUGUST 03, 2014

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DRAWN BY: N.G.H

CHECKED BY: R.J

REV : 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

A-7

PROPOSED LEFT SIDE ELEVATION (WEST)

1/4" = 1'-0"

REGISTERED ARCHITECT
RONALD F. JAREK
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NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED LEFT SIDE ELEVSTION

143 LINCOLN STREET
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Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014

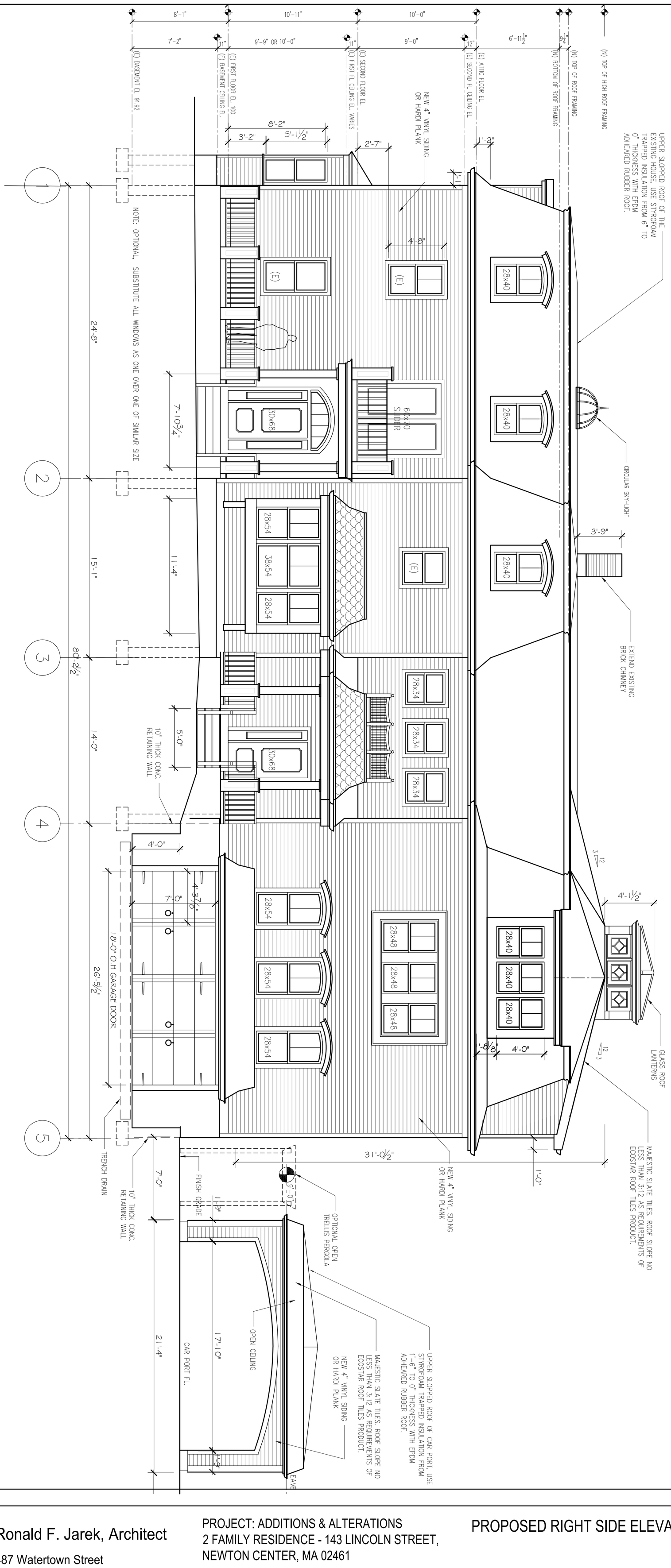
SCALE: AS NOTED

DRAWN BY: N.G.H

CHECKED BY: R.J

REV.: 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

A-9



PROPOSED RIGHT SIDE ELEVATION (EAST)

1/4" = 1'-0"

A-8

Ronald F. Jarek, Architect

487 Watertown Street
Newtonville, MA 02460

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

PROPOSED RIGHT SIDE ELEVATION

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

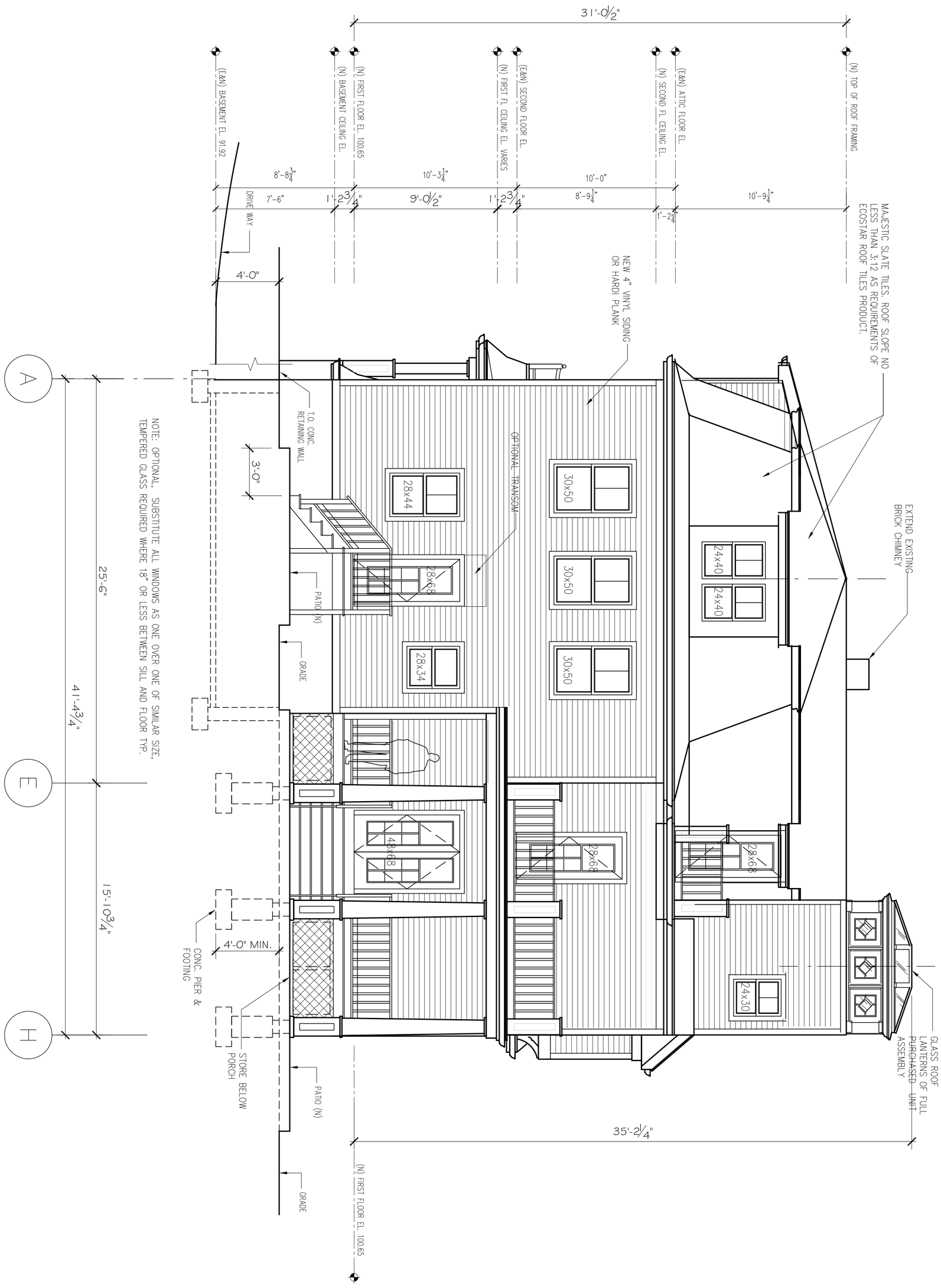
DATE: AUGUST 06, 2014
SCALE: AS NOTED
DRAWN BY: N.G.H
CHECKED BY: R.J
REV: 6-6-2014
REV: DATE 9-9-2014
10-9-2014

STAMP:

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4659
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

PROPOSED REAR ELEVATION (NORTH)

1/4" = 1'-0"



NOTE: OPTIONAL, SUBSTITUTE ALL WINDOWS AS ONE OVER ONE OF SIMILAR SIZE, TEMPERED GLASS REQUIRED WHERE 18" OR LESS BETWEEN SILL AND FLOOR TYP.

A-10

DATE: AUGUST 02, 2014
SCALE: AS NOTED
DRAWN BY: N.G.H
CHECKED BY: RJ
REV.: 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

Ronald F. Jarek, Architect

487 Watertown Street
Newtonville, MA 02460

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

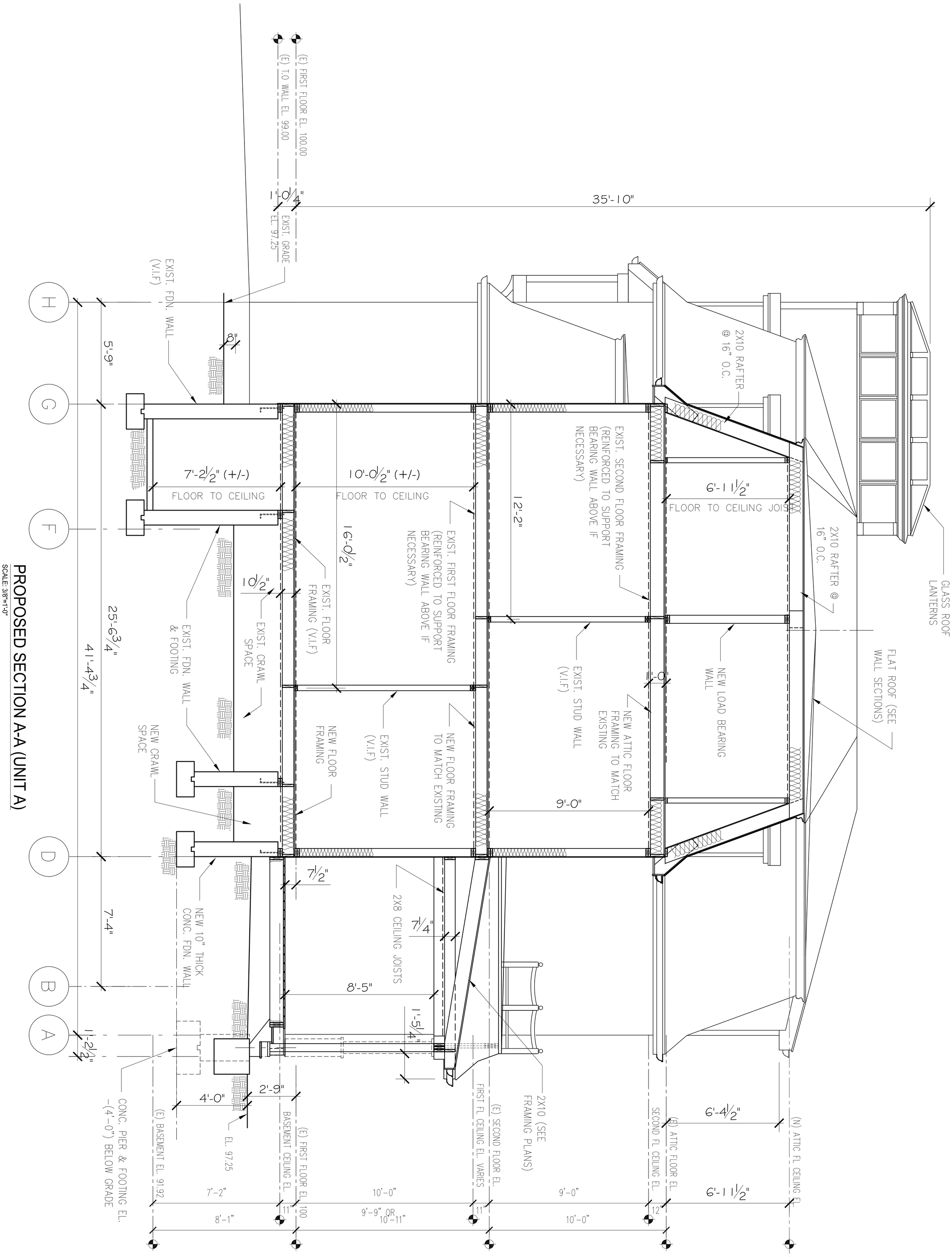
CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

PROPOSED REAR ELEVATION

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

STAMP:

COMMONWEALTH OF MASSACHUSETTS
REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.



PROPOSED SECTION A-A (UNIT A)

SCALE: 3/8"=1'-0"

A-11

REV.:	6-6-2014
REV. DATE:	9-9-2014
	10-9-2014
CHECKED BY:	RJ
DRAWN BY:	N.G.H
SCALE:	AS NOTED
DATE:	AUGUST 03, 2014

Ronald F. Jarek, Architect

487 Watertown Street
Newtonville, MA 02460

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

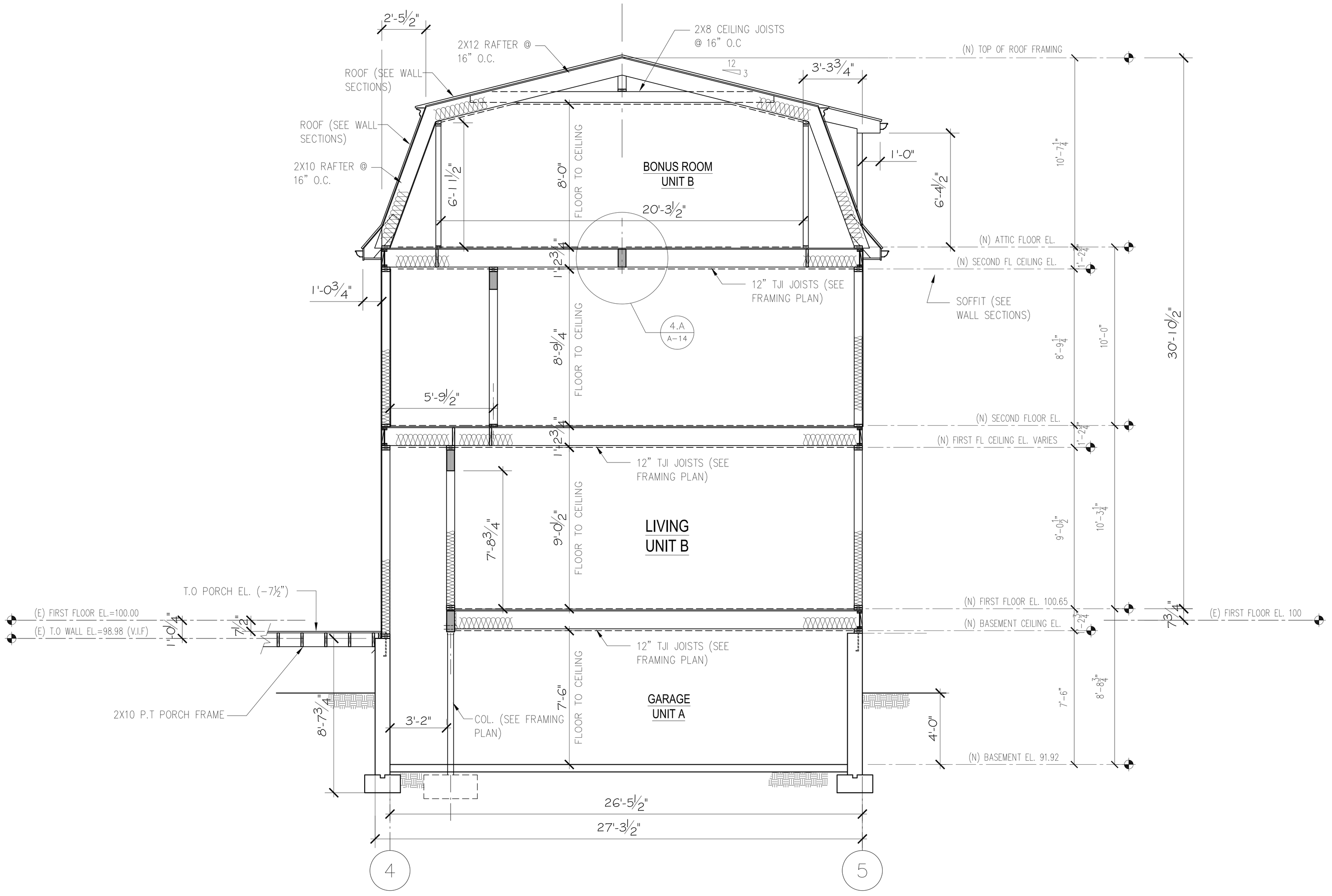
CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

PROPOSED SECTION A-A

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

STAMP:

COMMONWEALTH OF MASSACHUSETTS
REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.



PROPOSED SECTION B-B

SCALE: 3/8"=1'-0"

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED SECTION B-B

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014

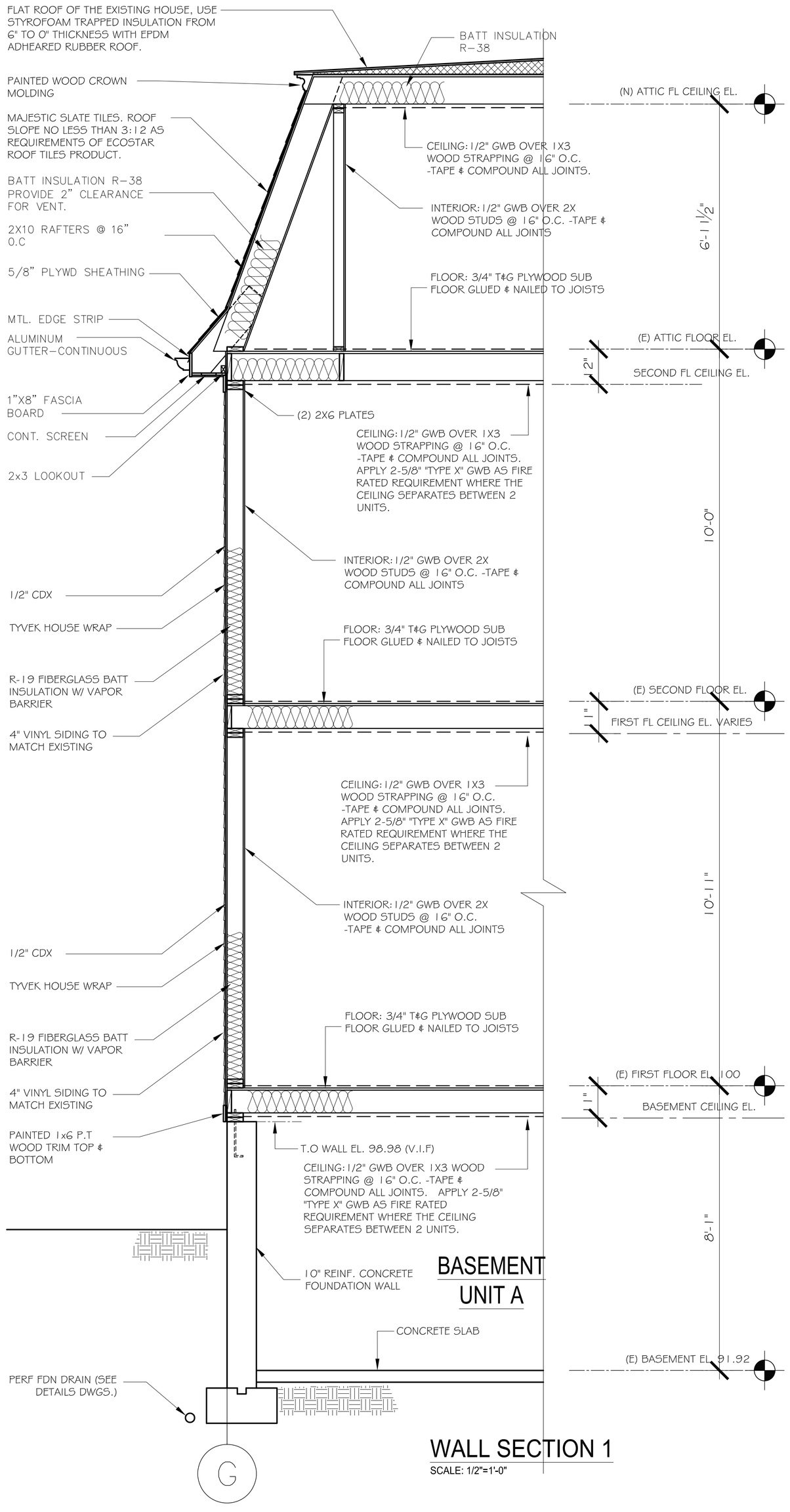
SCALE: AS NOTED

DRAWN BY: N.G.H

CHECKED BY: R.J

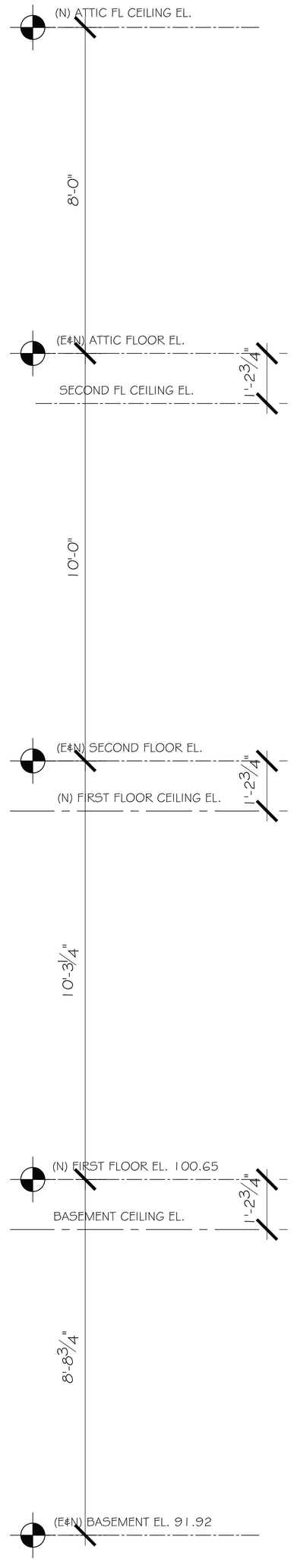
REV. : 6-6-2014
REV. DATE: 9-9-2014
10 -9-2014

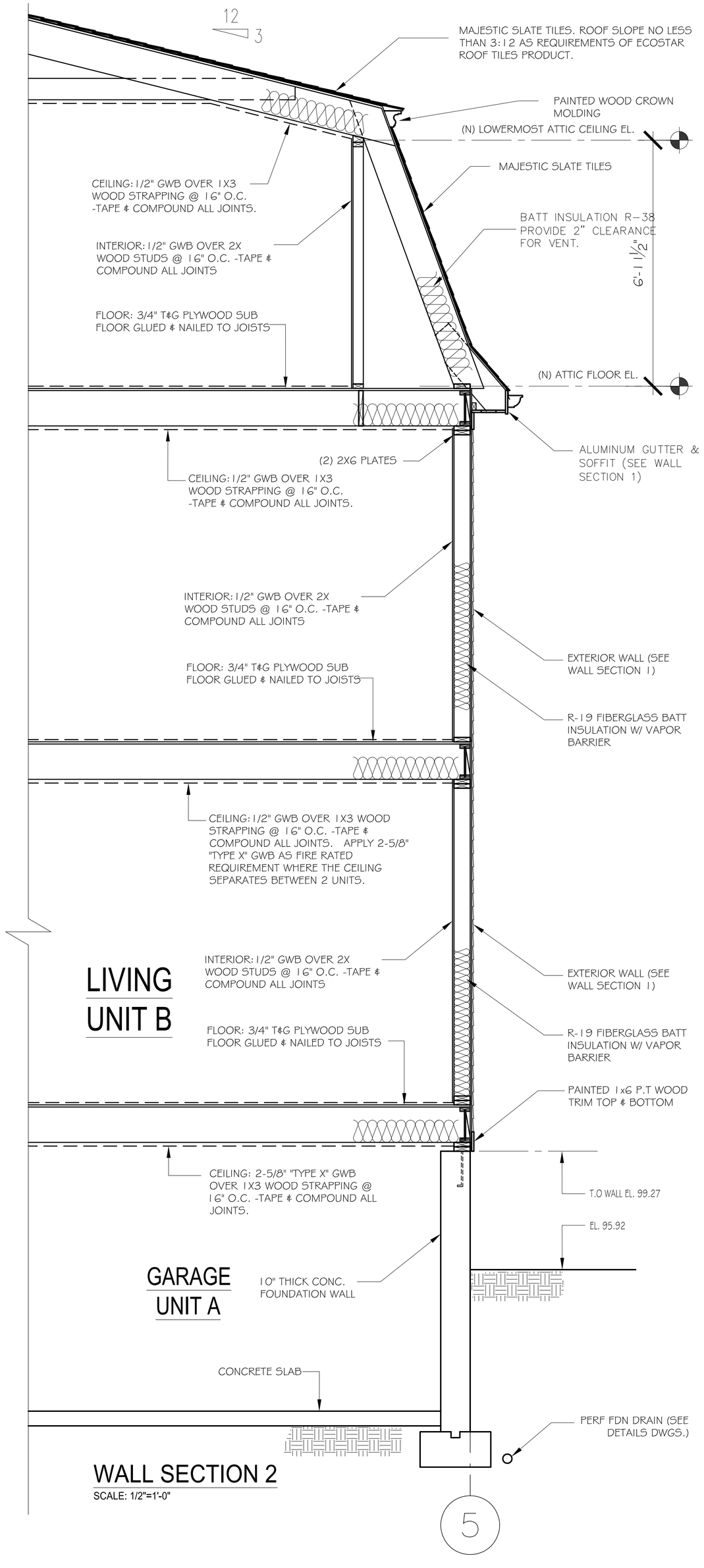
A-12



WALL SECTION 1

SCALE: 1/2"=1'-0"





WALL SECTION 2

SCALE: 1/2"=1'-0"

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED WALL SECTIONS

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

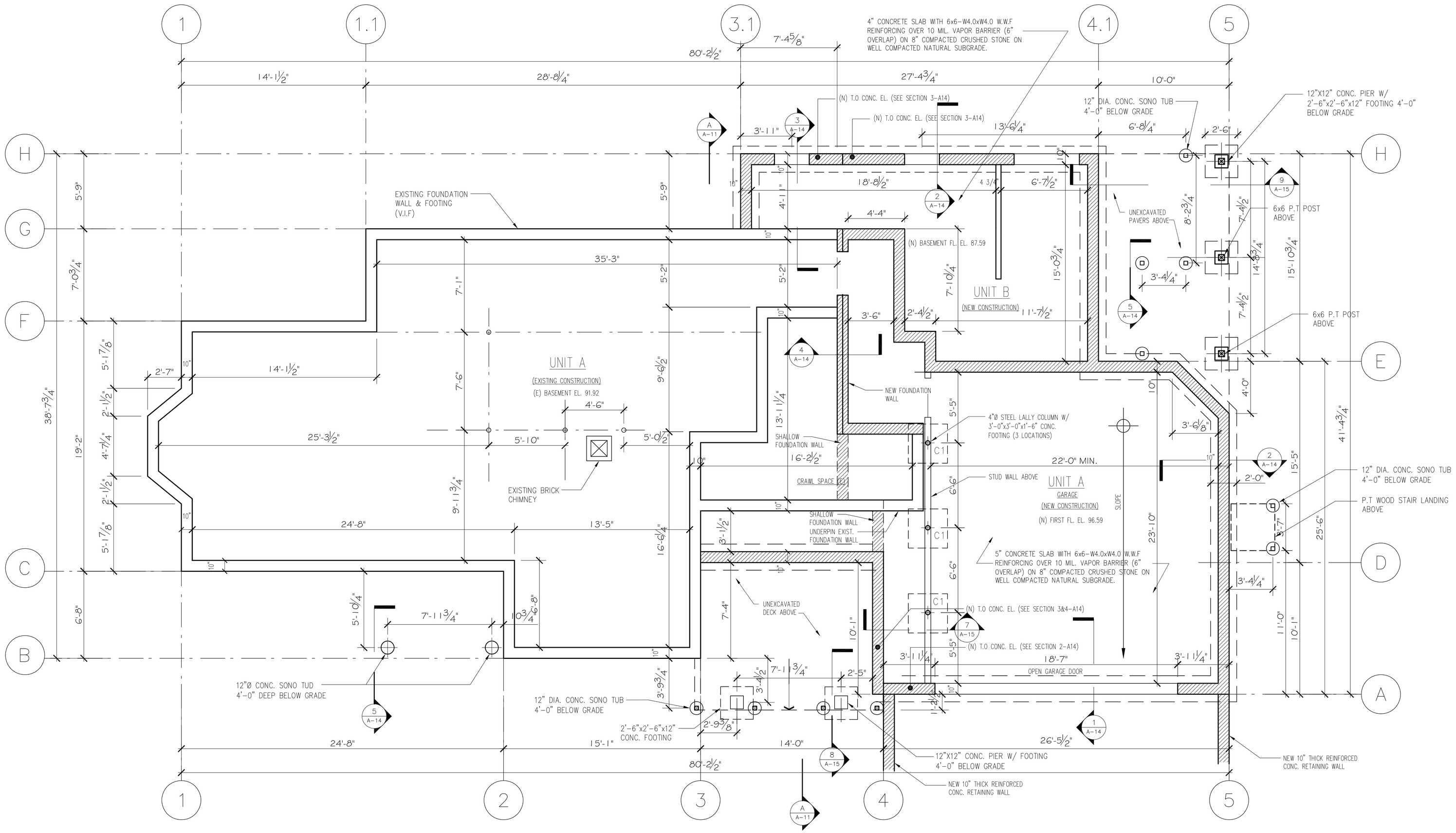
CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014
SCALE: AS NOTED
DRAWN BY: N.G.H
CHECKED BY: R.J
REV: 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

A-13



PROPOSED FOUNDATION PLAN

1/4" = 1'-0"

NOTES:

C1: 4"Ø LALLY STEEL COLUMN
P1: 6x6 P.T POST
P2: 6x6 P.T POST
P3: 6x6 P.T POST
P4: 4x6 PSL POST
P5: 6X6 PSL POST

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED FOUNDATION PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

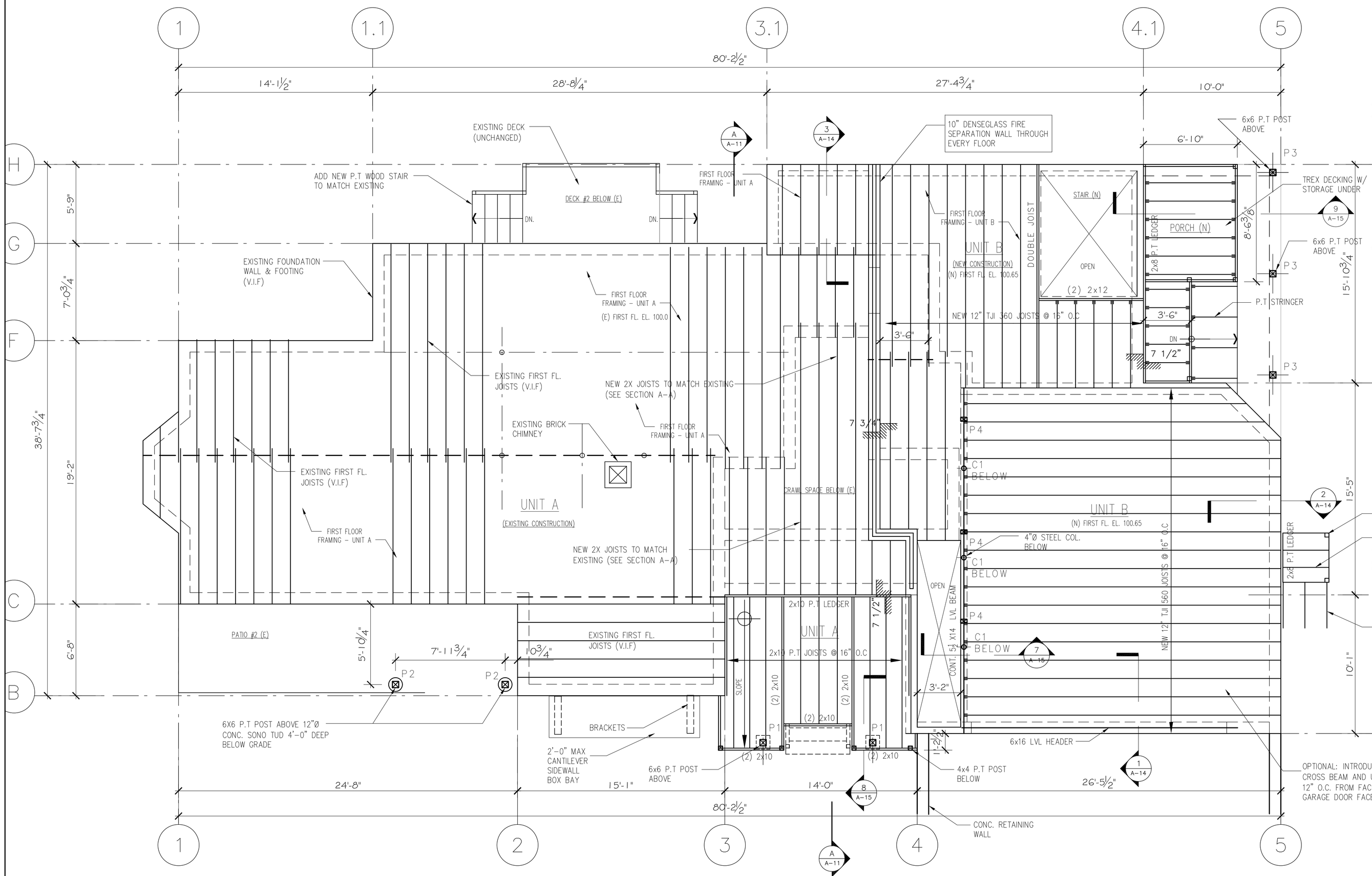
PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014
SCALE: AS NOTED
DRAWN BY: N.G.H
CHECKED BY: R.J
REV.: 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

F-1



PROPOSED FIRST FLOOR FRAMING PLAN

1/4" = 1'-0"

NOTES:

C1: 4"Ø LALLY STEEL COLUMN
P1: 6x6 P.T POST
P2: 6x6 P.T POST
P3: 6x6 P.T POST
P4: 4x6 PSL POST
P5: 6X6 PSL POST

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED FIRST FLOOR FRAMING PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014

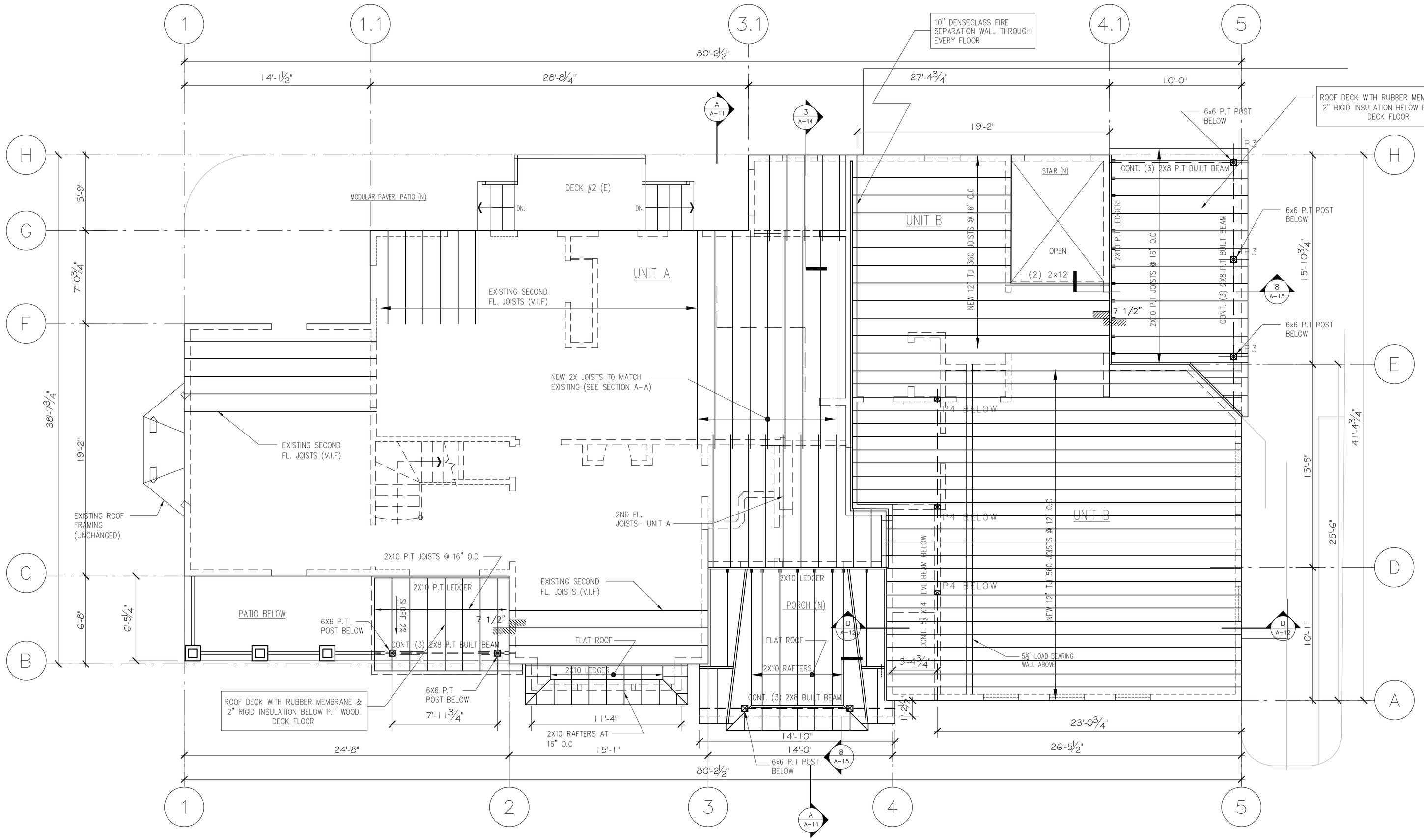
SCALE: AS NOTED

DRAWN BY: N.G.H

CHECKED BY: R.J

REV.: 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

F-2



PROPOSED SECOND FLOOR FRAMING PLAN

1/4" = 1'-0"

NOTES:

C1: 4"Ø LALLY STEEL COLUMN
P1: 6x6 P.T POST
P2: 6x6 P.T POST
P3: 6x6 P.T POST
P4: 4x6 PSL POST
P5: 6X6 PSL POST

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED SECOND FLOOR
FRAMING PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014

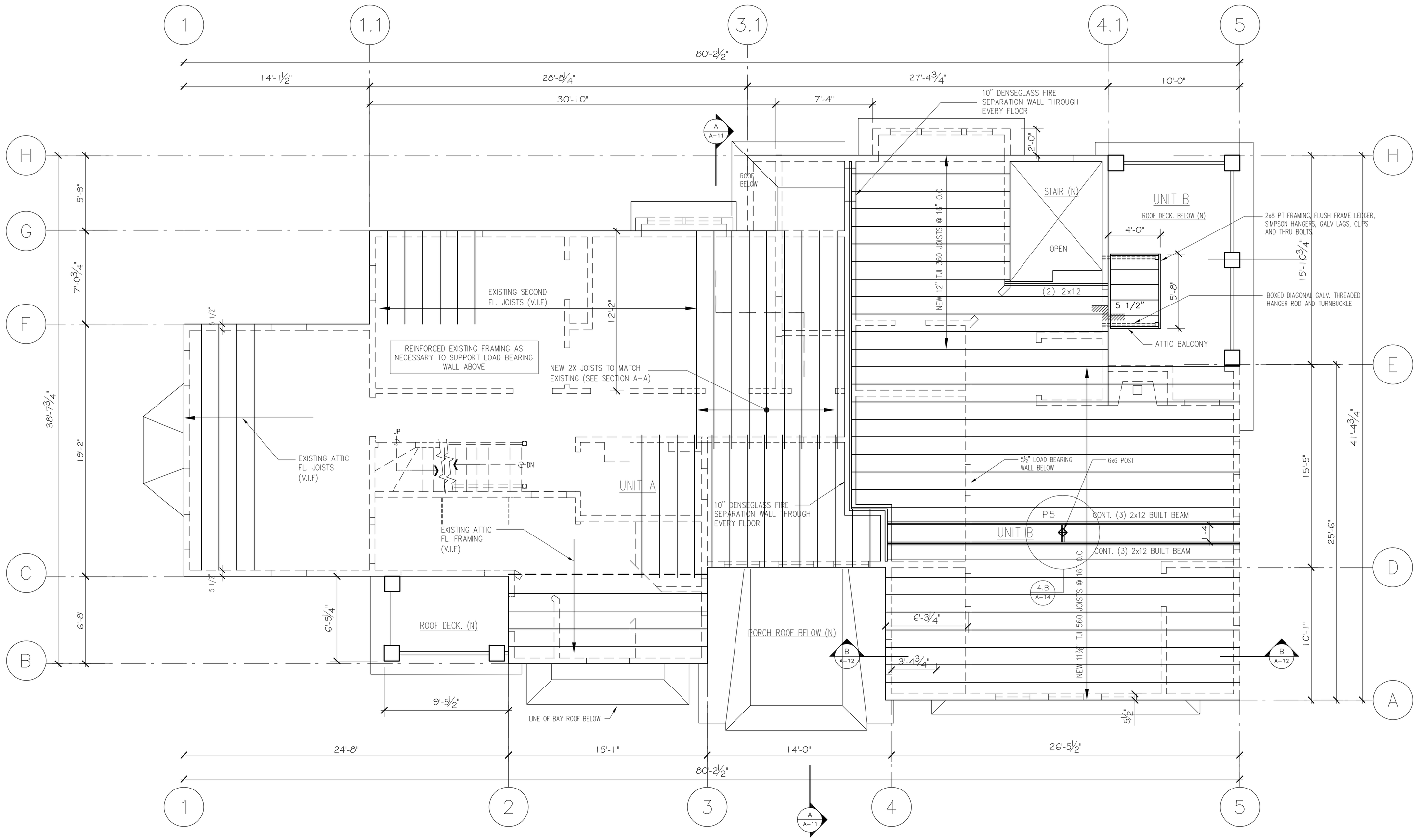
SCALE: AS NOTED

DRAWN BY: N.G.H

CHECKED BY: R.J

REV.: 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

F-3



PROPOSED ATTIC (THIRD) FLOOR FRAMING PLAN

1/4" = 1'-0"

NOTES:

C1: 4"Ø LALLY STEEL COLUMN
P1: 6x6 P.T POST
P2: 6x6 P.T POST
P3: 6x6 P.T POST
P4: 4x6 PSL POST
P5: 6X6 PSL POST

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROPOSED ATTIC & THIRD FLOOR FRAMING PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014

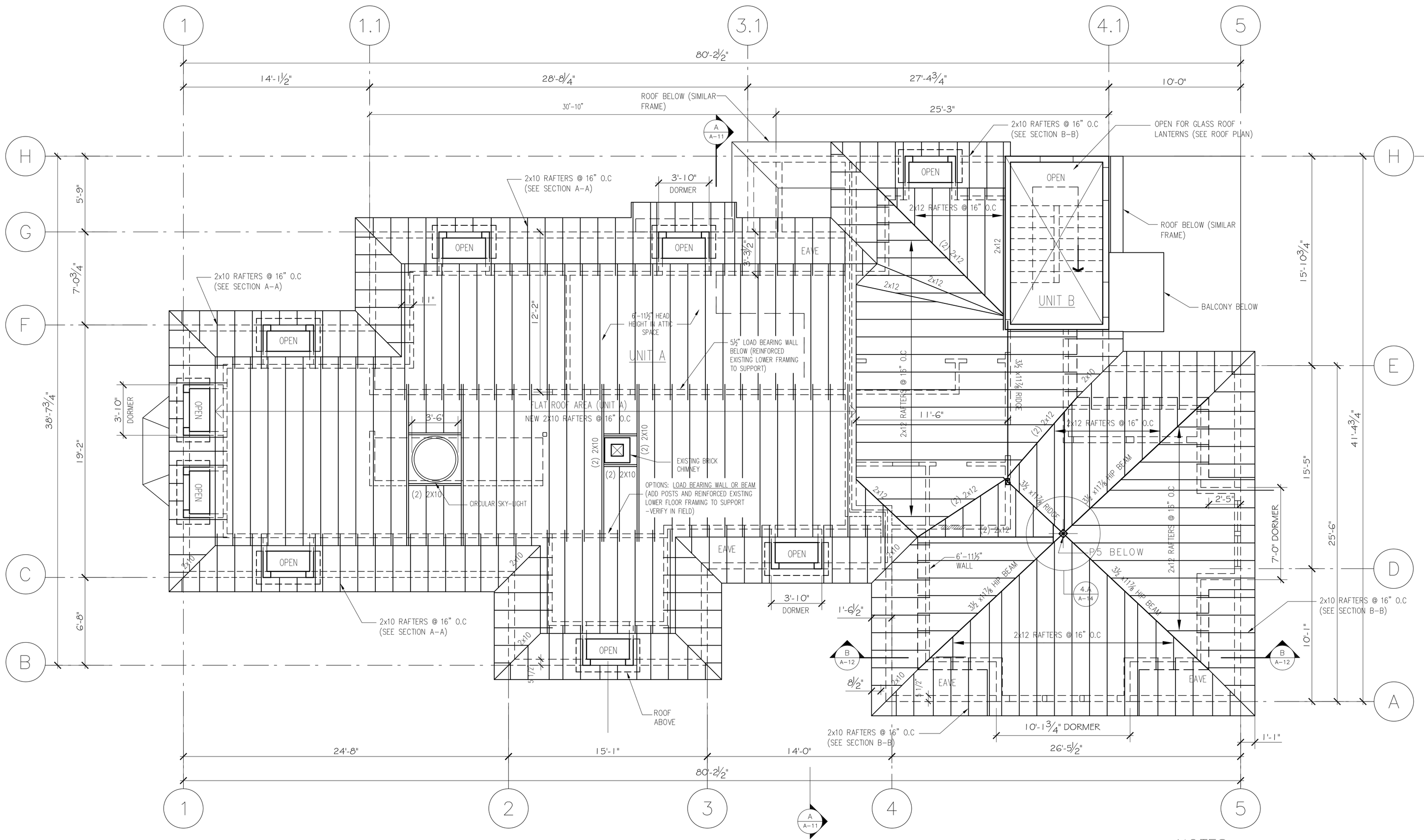
SCALE: AS NOTED

DRAWN BY: N.G.H

CHECKED BY: R.J

REV : 6-6-2014
REV. DATE: 9-9-2014
10 -9-2014

F-4



PROPOSED ROOF FRAMING PLAN

1/4" = 1'-0"

NOTES:

C1: 4"Ø LALLY STEEL COLUMN
P1: 6x6 P.T POST
P2: 6x6 P.T POST
P3: 6x6 P.T POST
P4: 4x6 PSL POST
P5: 6X6 PSL POST

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

STAMP:

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

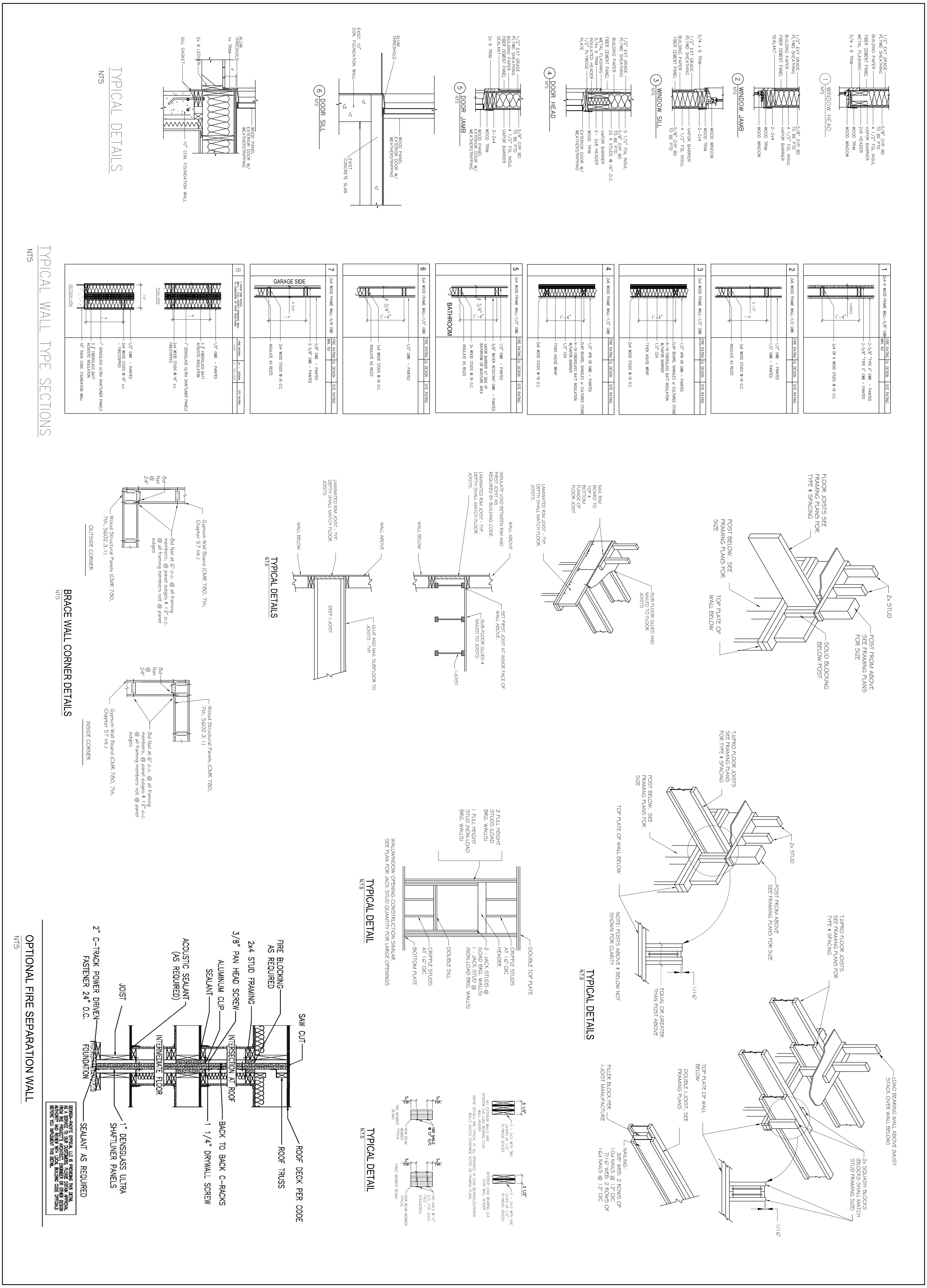
PROPOSED ROOF FRAMING PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: AUGUST 03, 2014
SCALE: AS NOTED
DRAWN BY: N.G.H
CHECKED BY: R.J
REV : 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

F-5

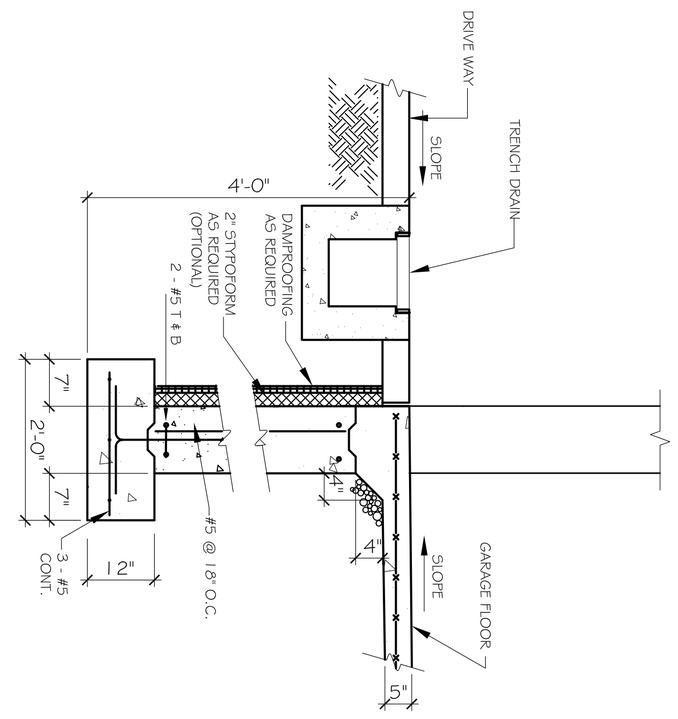


F-6	DATE: AUGUST 05, 2014 SCALE: AS NOTED DRAWN BY: NGH CHECKED BY: RJ REV: 6-6-2014	**Ronald F. Jarek, Architect** 487 Watertown Street Newtonville, MA 02460	PROJECT: ADDITIONS & ALTERATIONS 2 FAMILY RESIDENCE - 143 LINCOLN STREET, NEWTON CENTER, MA 02461 CLIENT: ARMAN CHITCHIAN 79 BRANDEIS ROAD NEWTON CENTER, MA 02459

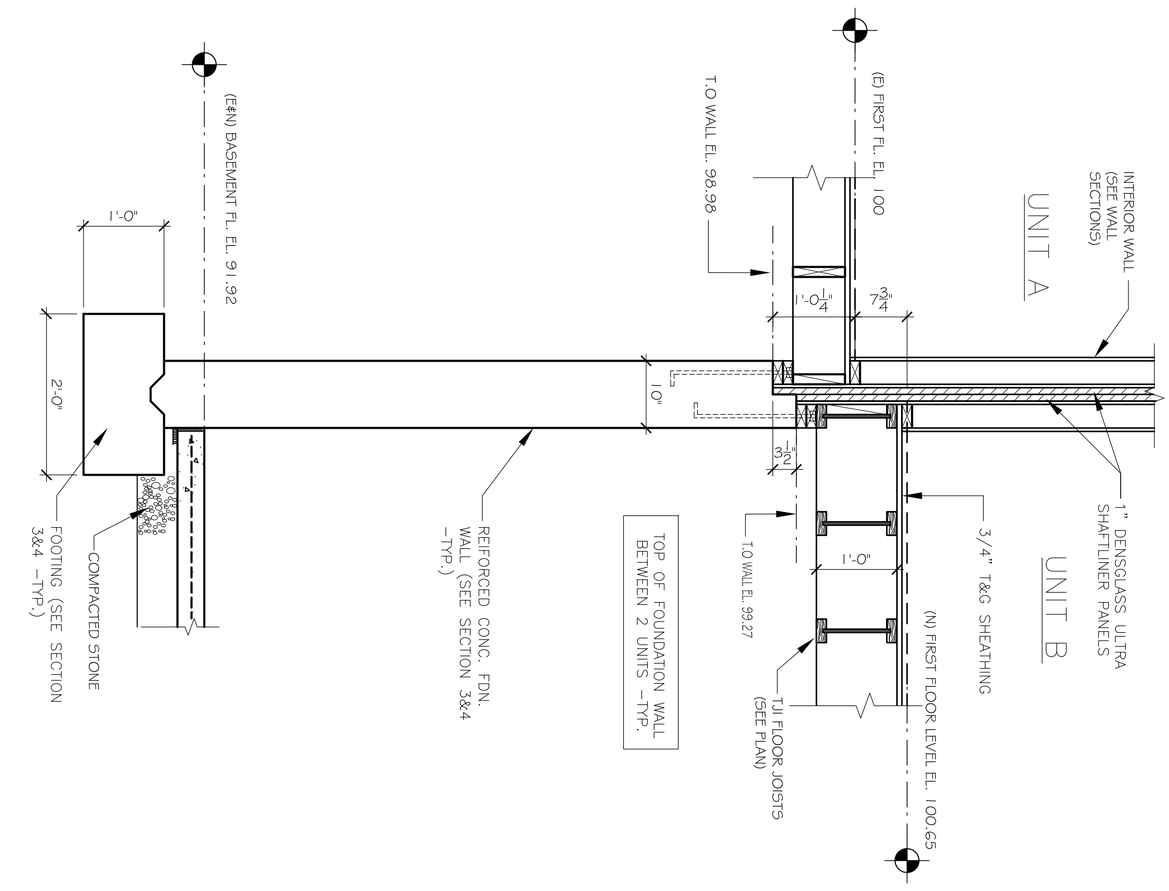
TYPICAL SECTIONS & DETAILS

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

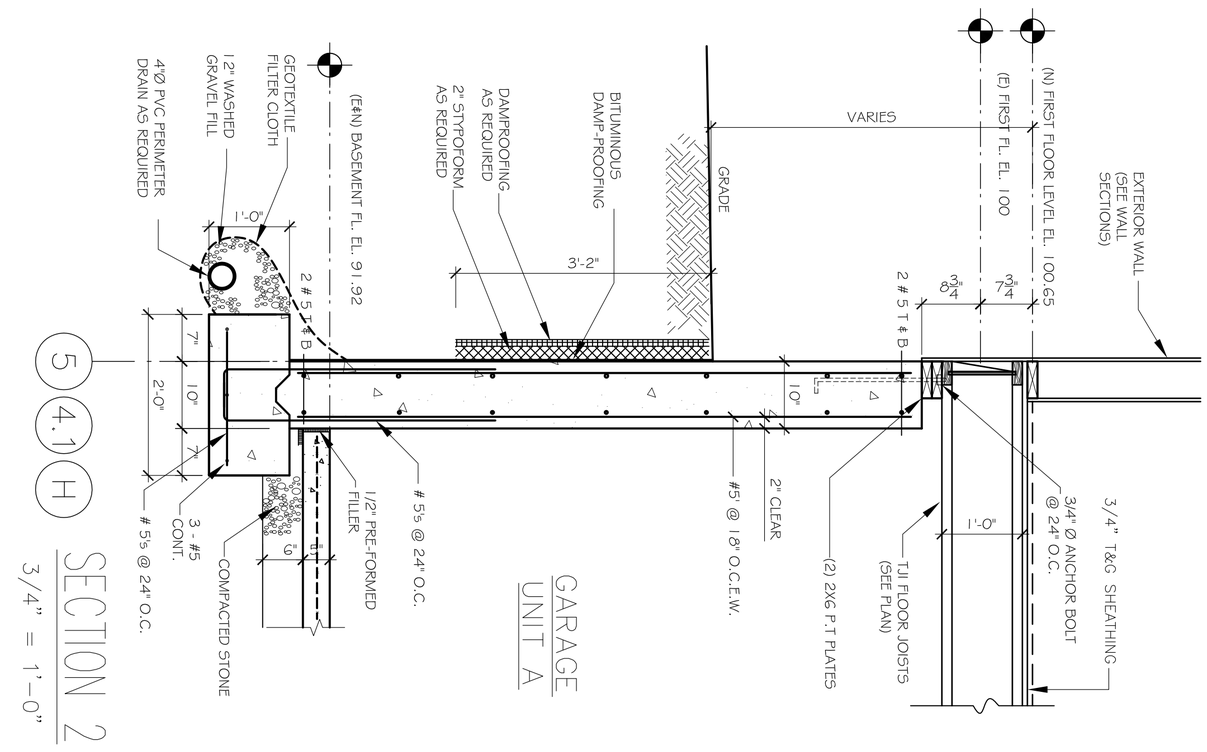
STAMP:



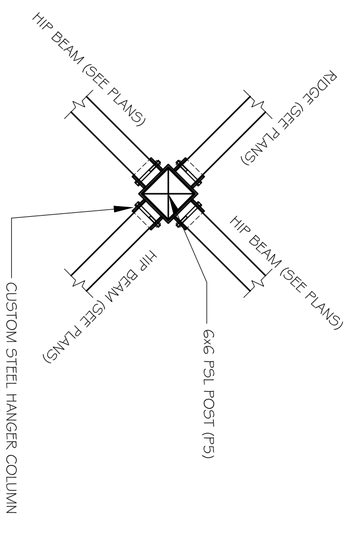
SECTION 1
3/4" = 1'-0"



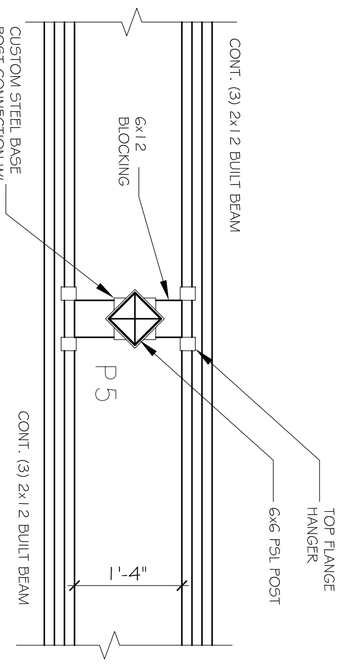
SECTION 4
3/4" = 1'-0"



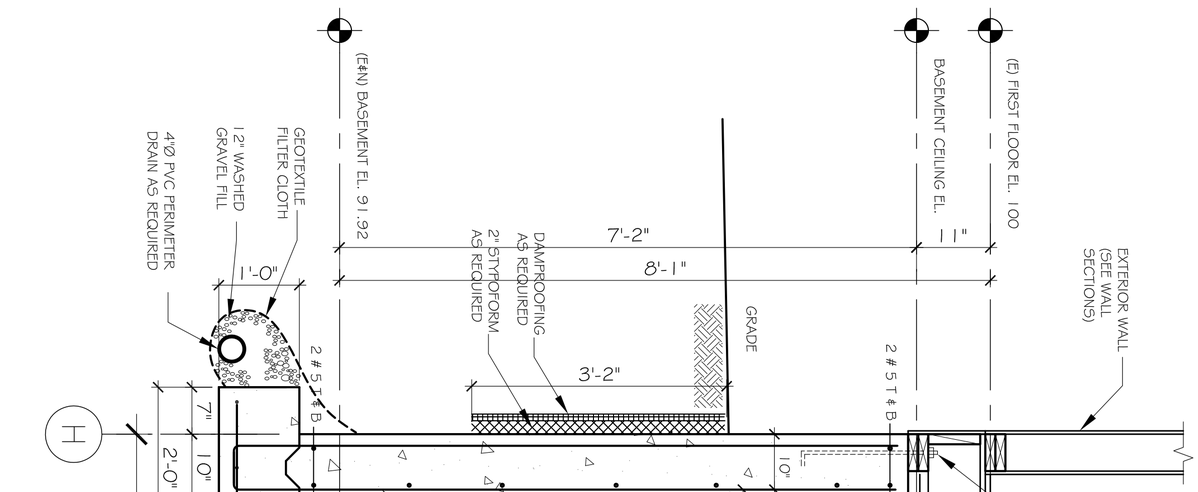
SECTION 2
3/4" = 1'-0"



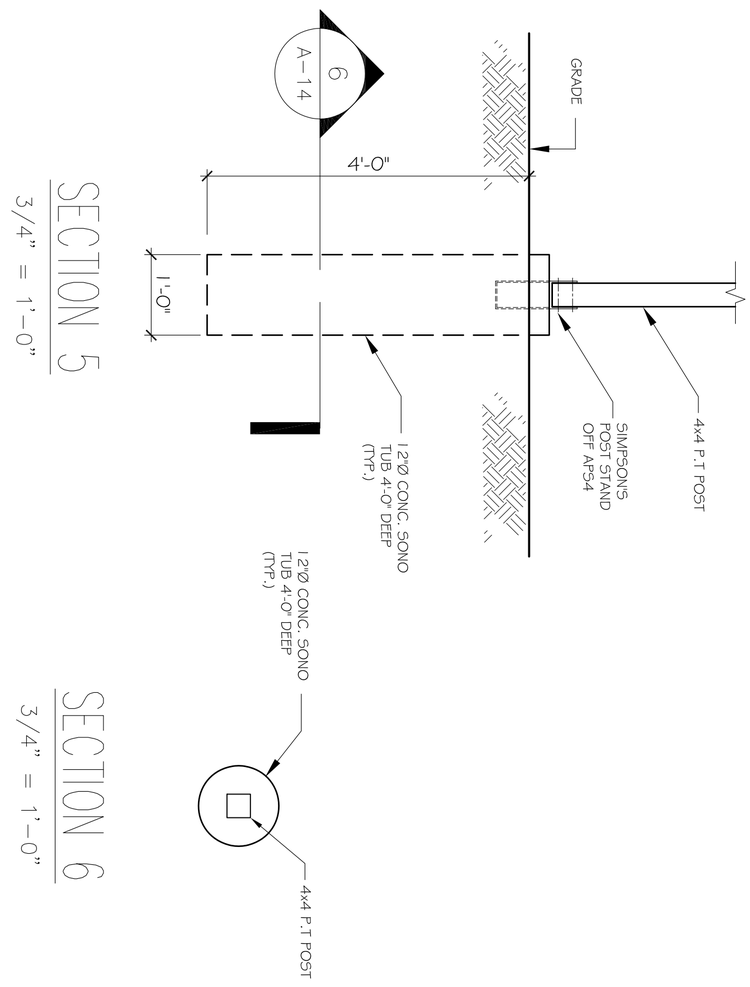
PLAN SECTION 4,A
3/4" = 1'-0"



PLAN SECTION 4,B
3/4" = 1'-0"



SECTION 3
3/4" = 1'-0"



SECTION 5
3/4" = 1'-0"

SECTION 6
3/4" = 1'-0"

A-14

REV.: 6-6-2014
REV. DATE: 9-9-2014
10-9-2014

DATE: AUGUST 03, 2014

SCALE: AS NOTED

DRAWN BY: N.G.H

CHECKED BY: RJ

STAMP:

REGISTERED ARCHITECT RONALD F. JAREK No. 4653 NEWTON, MASS. COMMONWEALTH OF MASSACHUSETTS

Ronald F. Jarek, Architect

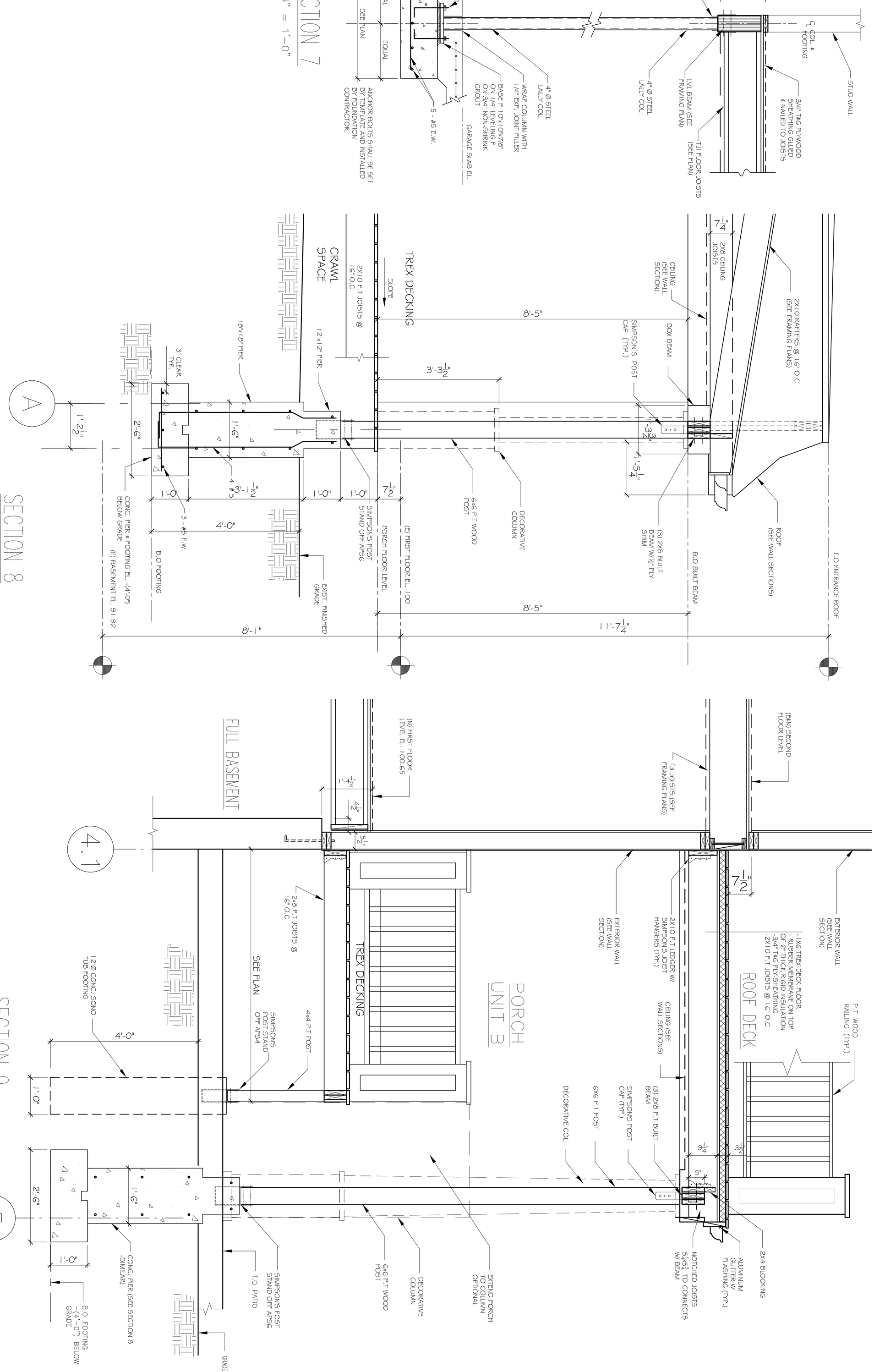
487 Watertown Street
Newtonville, MA 02460

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

PROPOSED SECTIONS & DETAILS

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461



A-15

DATE:	AUGUST 03, 2014
SCALE:	AS NOTED
DRAWN BY:	N.G.H
CHECKED BY:	R.J
REV:	6-6-2014
REV. DATE:	9-9-2014
	10-9-2014

Ronald F. Jarek, Architect

487 Watertown Street
Newtonville, MA 02460

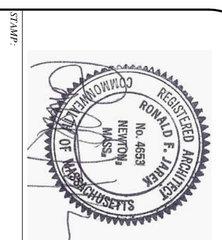
PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET, NEWTON CENTER, MA 02461

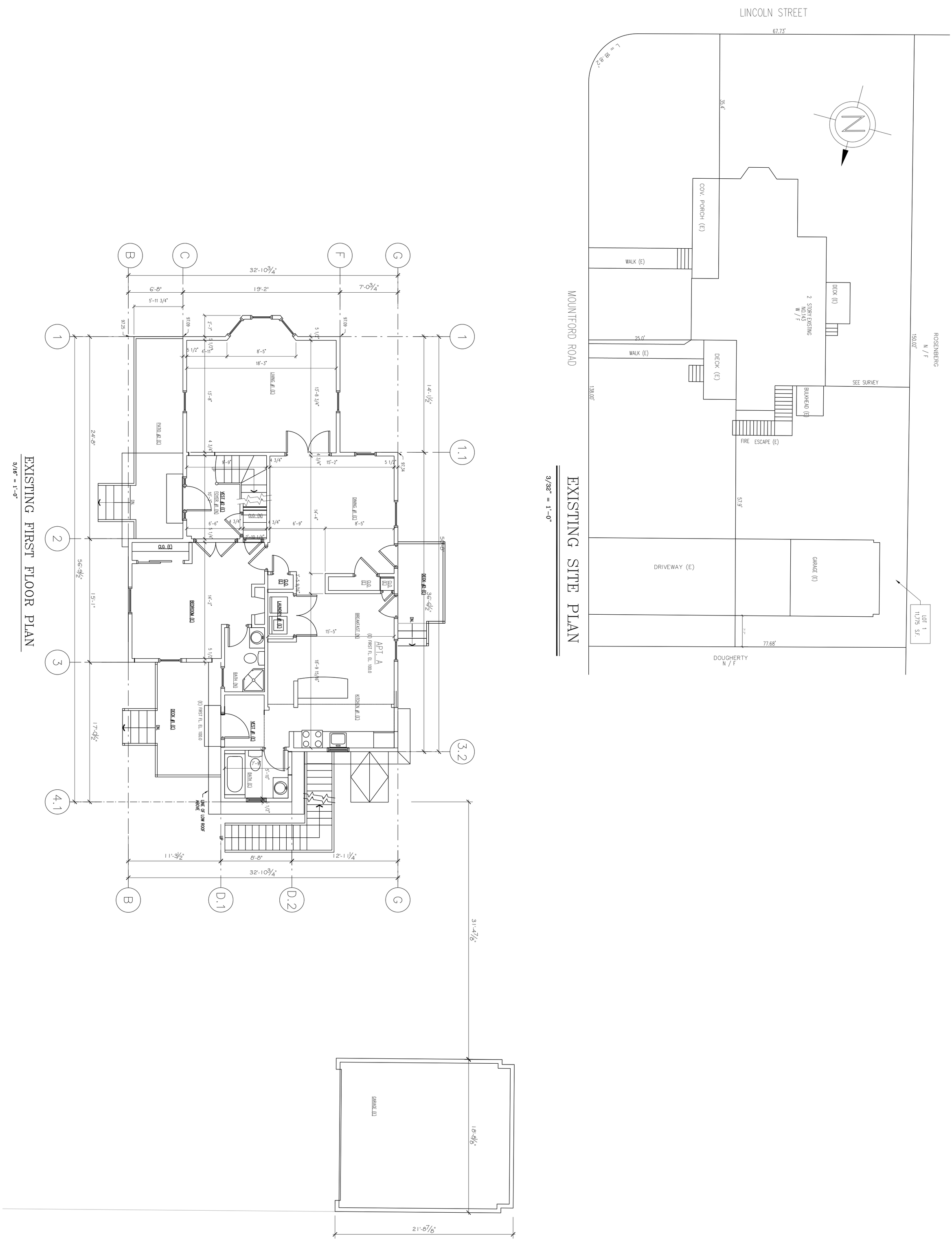
CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

PROPOSED SECTIONS & DETAILS

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

STAMP:





EXISTING FIRST FLOOR PLAN

3/16" = 1'-0"

EXISTING SITE PLAN

3/32" = 1'-0"

EX-1

DATE:	MAY 24, 2014
SCALE:	AS NOTED
DRAWN BY:	N.G.H
CHECKED BY:	R.J
REISSUED DATE: 9-9-2014	
10-9-2014	

Ronald F. Jarek, Architect

487 Watertown Street
Newtonville, MA 02460

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

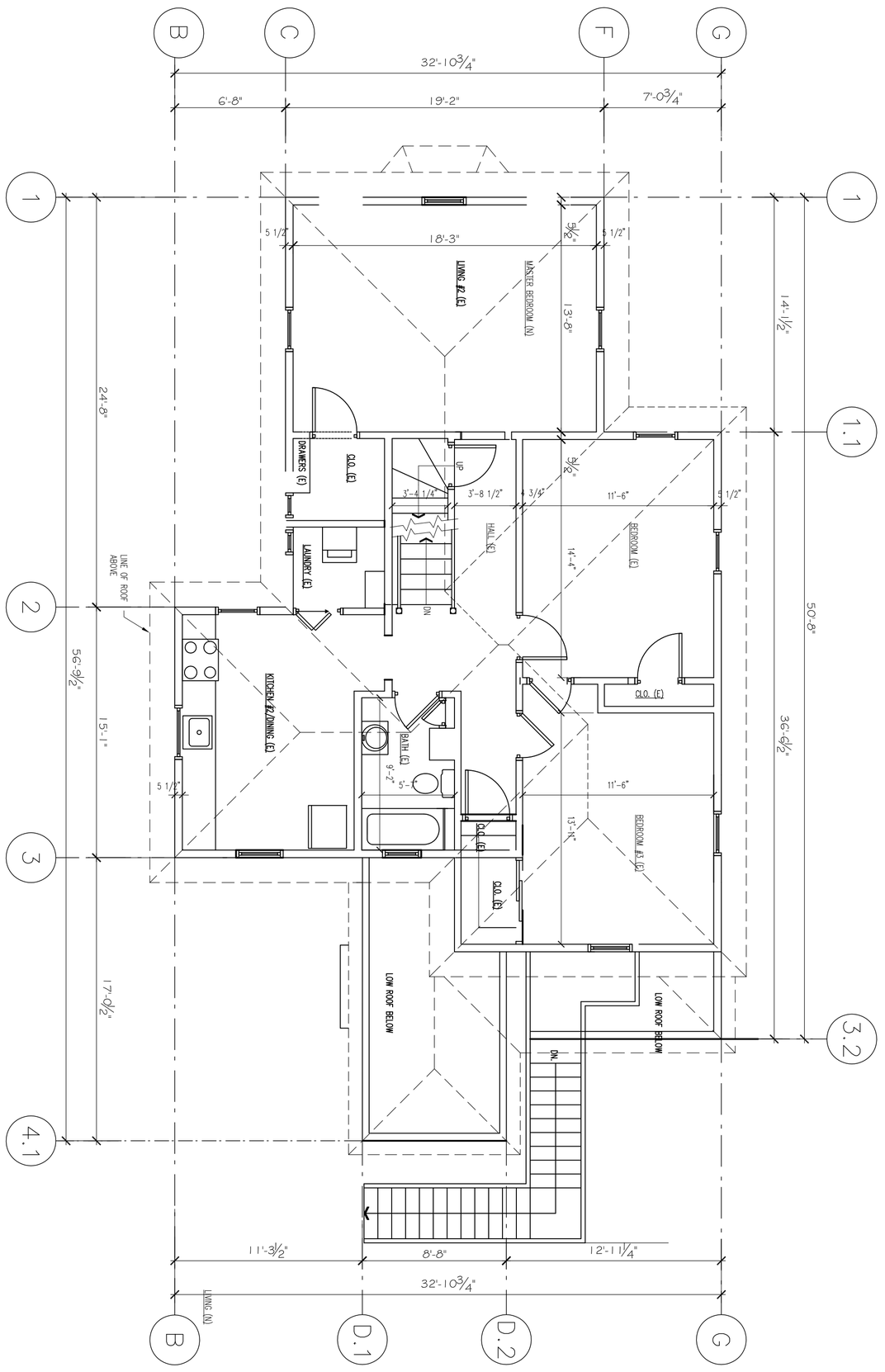
CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

EXISTING FIRST FLOOR PLAN

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

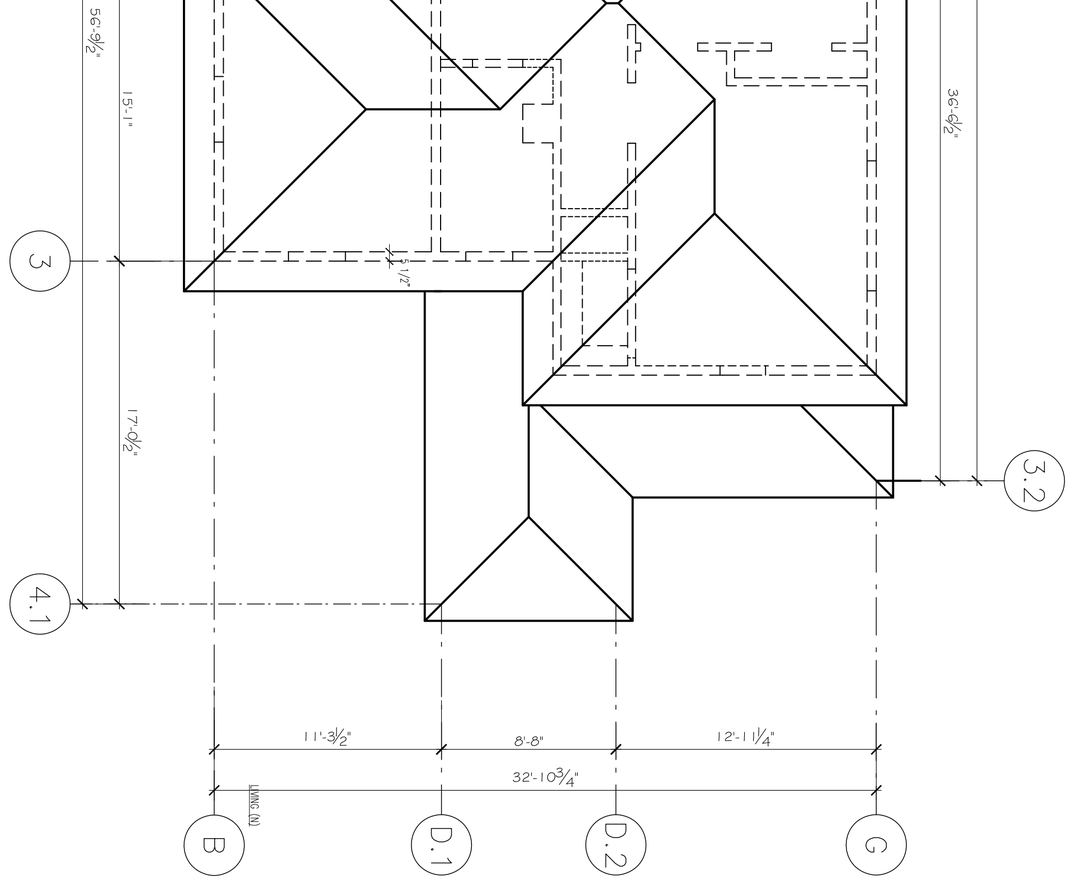
STAMP:

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS



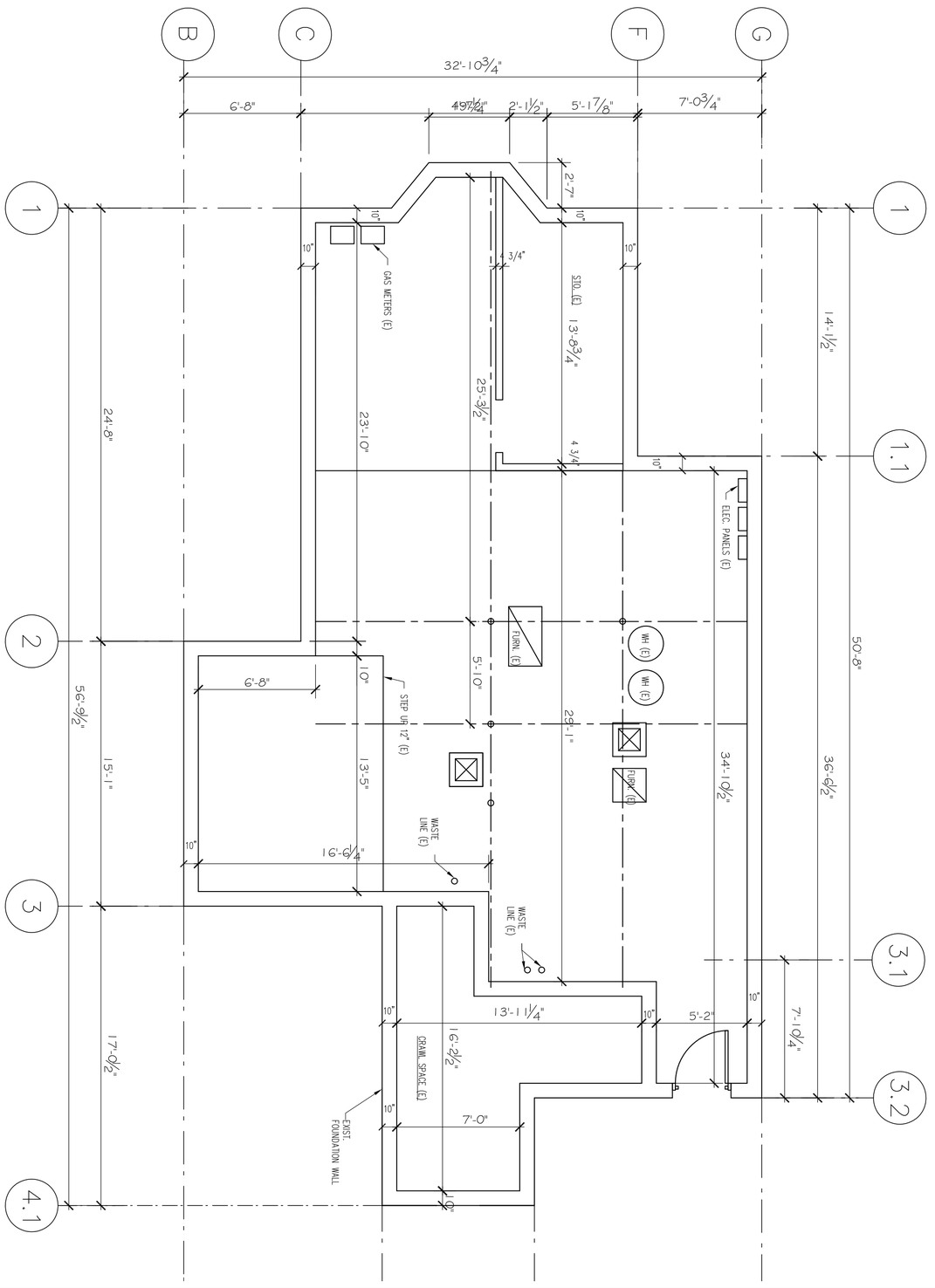
EXISTING SECOND FLOOR PLAN

3/16" = 1'-0"



EXISTING ROOF PLAN

3/16" = 1'-0"



EXISTING BASEMENT FLOOR PLAN

3/16" = 1'-0"

EX-2

DATE:	MAY 24, 2014
SCALE:	AS NOTED
DRAWN BY:	N.G.H
CHECKED BY:	R.J
REISSUED DATE: 9-9-2014	
10-9-2014	

Ronald F. Jarek, Architect

487 Watertown Street
Newtonville, MA 02460

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461

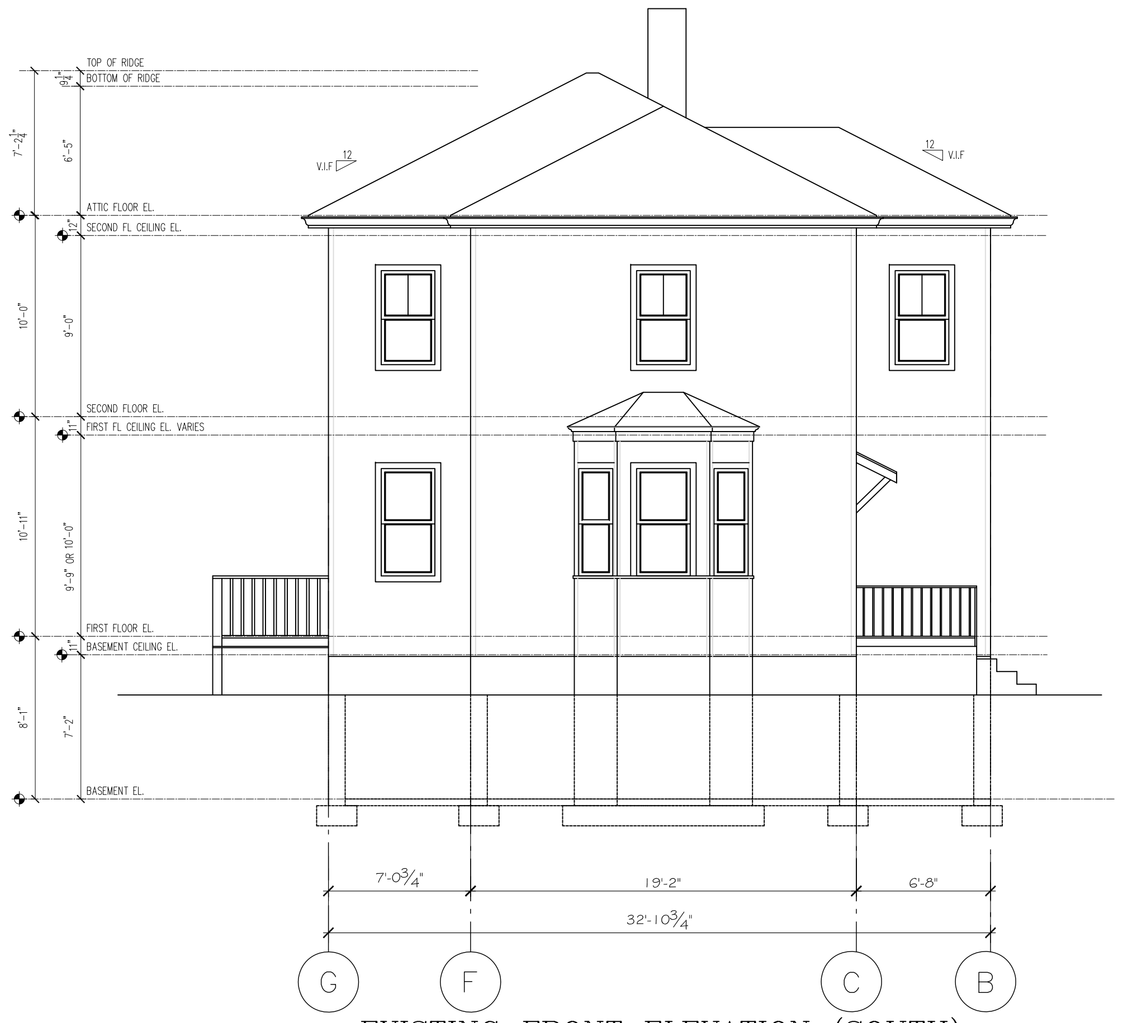
CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

EXISTING SECOND, BASEMENT & ROOF PLANS

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

STAMP:

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

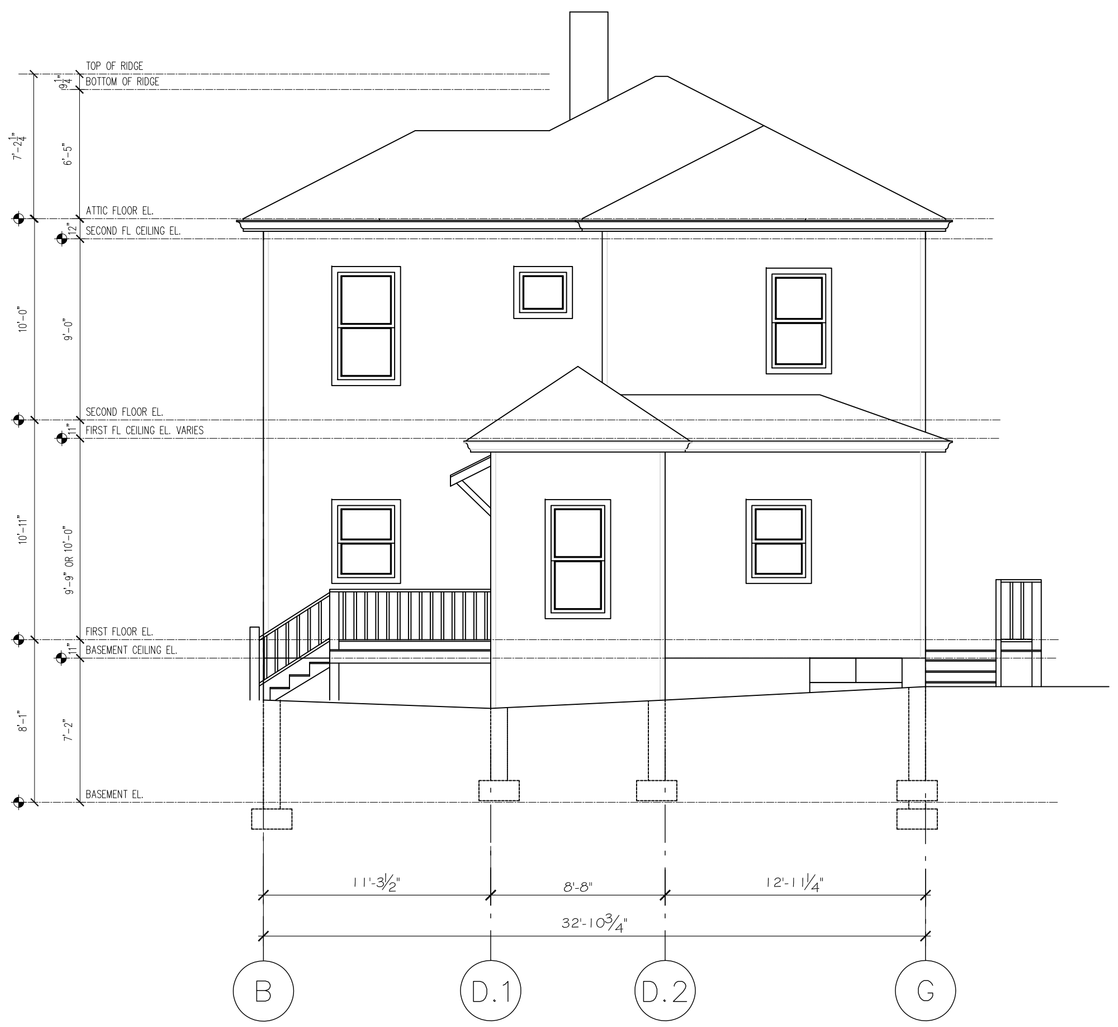


EXISTING FRONT ELEVATION (SOUTH)

3/16" = 1'-0"

EXISTING RIGHT SIDE ELEVATION (EAST)

3/16" = 1'-0"



EXISTING REAR ELEVATION (NORTH)

3/16" = 1'-0"

EXISTING LEFT SIDE ELEVATION (WEST)

3/16" = 1'-0"

STAMP:

REGISTERED ARCHITECT
RONALD F. JAREK
No. 4653
NEWTON, MASS.
COMMONWEALTH OF MASSACHUSETTS

EXISTING ELEVATIONS

143 LINCOLN STREET
NEWTON HIGHLANDS, MA 02461

PROJECT: ADDITIONS & ALTERATIONS
2 FAMILY RESIDENCE - 143 LINCOLN STREET,
NEWTON CENTER, MA 02461
CLIENT: ARMAN CHITCHIAN
79 BRANDEIS ROAD
NEWTON CENTER, MA 02459

Ronald F. Jarek, Architect
487 Watertown Street
Newtonville, MA 02460

DATE: MAY 24, 2014

SCALE: AS NOTED

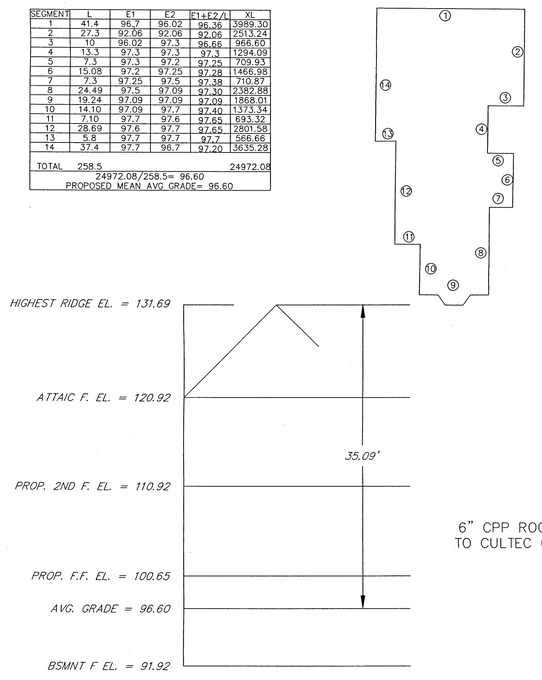
DRAWN BY: N.G.H

CHECKED BY: R.J

REISSUED. DATE: 9-9-2014
10 -9-2014

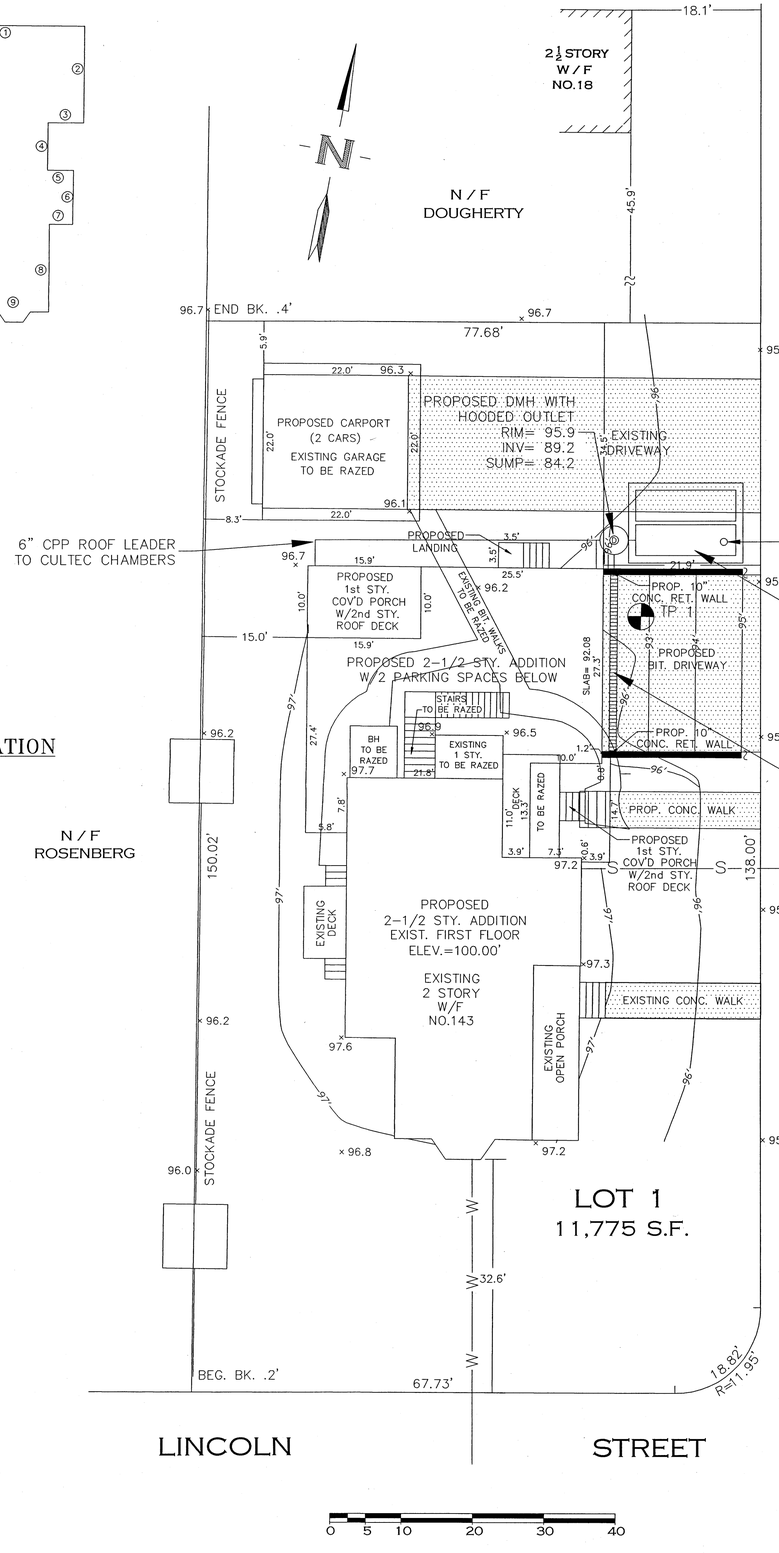
EX-3

SEGMENT	L	E1	E2	E1+E2/L	XL
1	41.4	96.7	96.02	96.36	3989.30
2	27.3	92.06	92.06	92.06	2513.24
3	10	96.02	97.3	96.66	966.60
4	13.3	97.3	97.3	97.3	1294.09
5	7.3	97.3	97.2	97.25	709.93
6	15.08	97.2	97.25	97.28	1466.98
7	7.3	97.25	97.5	97.38	710.87
8	24.49	97.5	97.09	97.30	2382.88
9	19.24	97.09	97.09	97.09	1868.01
10	14.10	97.09	97.7	97.40	1373.34
11	7.10	97.7	97.6	97.65	693.32
12	28.69	97.6	97.7	97.65	2801.56
13	5.8	97.7	97.7	97.7	566.66
14	37.4	97.7	96.7	97.20	3635.28
TOTAL	258.5				24972.08
24972.08/258.5= 96.60					
PROPOSED MEAN AVG GRADE= 96.60					



PROP. DWELLING HEIGHT CALCULATION

MASS BELOW:
24.79/258.5= .096 (9.6%)
.096*2,24.5 SF= 232.51 SF



TBM – EXISTING FIRST FLOOR=100.00' (ASSUMED)

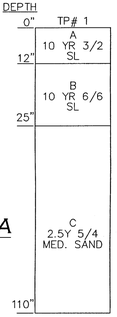
ZONING CHART NEWTON, MASSACHUSETTS			
ZONE SR2			
PRE-12/7/53			
	REQUIRED	EXISTING	PROPOSED
LOT AREA	10,000 SF	11,775 SF	NC
FRONTAGE	80 FT	150 FT	NC
FRONT	25 FT	96.02	21.9 FT
SIDE	7.5 FT	97.3	34.5 FT
REAR	15 FT	97.3	14.9 FT
HEIGHT	36 FT	–	35.09 FT
AVG GRADE	–	–	96.60
LOT COVERAGE	30%	–	26.1%
OPEN SPACE	50%	–	55.9%

DEEP OBSERVATION HOLE DATA

TP# 1: NO GROUNDWATER ENCOUNTERED
NO MOTTLES

DATE: SEPTEMBER 7, 2011
BY: STEPHEN B. NELSON, REHS/RS

NOTE: ESTIMATED SEASONAL HIGH GROUNDWATER > 110"

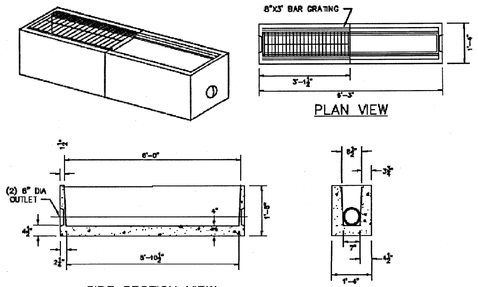


PERCOLATION TEST DATA

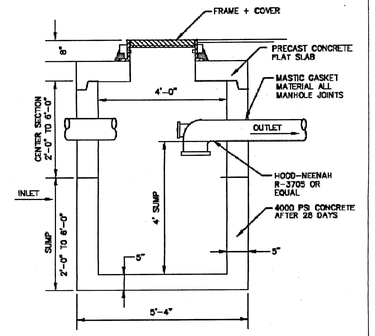
HOLE: TP-1
DEPTH: 34"
RATE: < 2MPI
DATE: SEPTEMBER 7, 2011
BY: STEPHEN B. NELSON, REHS/RS

GENERAL NOTES:

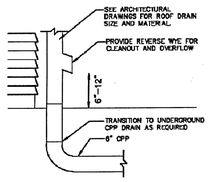
1. NO EXCAVATION IS ALLOWED WITHIN ANY CITY RIGHT-OF-WAY BETWEEN NOVEMBER 15TH AND APRIL 15TH. IF AN EMERGENCY EXISTS OR THERE ARE EXTENUATING CIRCUMSTANCES, APPLICANT MAY SEEK PERMISSION FOR SUCH WORK FROM THE CITY DPW COMMISSIONER VIA THE CITY ENGINEER. IF PERMISSION IS GRANTED,SPECIAL CONSTRUCTION STANDARDS WILL BE APPLIED. APPLICANT OR APPLICANT'S REPRESENTATIVE MUST CONTACT THE CITY OF NEWTON ENGINEERING DEPARTMENT PRIOR TO START OF WORK FOR CLARIFICATION.
2. AS OF JANUARY 1, 2009, ALL TRENCH EXCAVATION CONTRACTORS SHALL COMPLY WITH MASSACHUSETTS GENERAL LAWS CHAPTER 82A, TRENCH EXCAVATION SAFETY REQUIREMENTS, TO PROTECT GENERAL PUBLIC FROM UNAUTHORIZED ACCESS TO UNATTENDED TRENCHES. TRENCH EXCAVATION PERMIT REQUIRED. THIS APPLIES TO ALL TRENCHES ON PUBLIC OR PRIVATE PROPERTY.
3. THE APPLICANT WILL HAVE TO APPLY FOR STREET OPENING, AND AN INSTALL CURB & SIDEWALK PERMIT WITH THE DPW PRIOR TO START OF WORK.
4. AFTER ALL ENGINEERING PERMITS ARE OBTAINED, THE CONTRACTOR NEEDS TO NOTIFY THE ENGINEERING DIVISION 48-HOURS IN ADVANCE AND SCHEDULE AN APPOINTMENT TO HAVE THE DRAINAGE INSPECTED. THE SYSTEM & UTILITIES MUST BE FULLY EXPOSED FOR THE INSPECTOR. ONCE THE INSPECTOR IS SATISFIED, THE SYSTEM & UTILITIES MAY THEN BE BACK FILLED.
5. WITH THE EXCEPTION OF GAS SERVICES, ALL UTILITY TRENCHES WITHIN THE CITY OF NEWTON RIGHT-OF-WAY WILL BE BACK FILLED WITH TYPE IE (EXCAVATABLE) CONTROLLED DENSITY FILL, AS SPECIFIED BY THE CITY OF NEWTON ENGINEERING SPECIFICATIONS.
6. PRIOR TO THE ISSUANCE OF AN OCCUPANCY PERMIT, AN AS-BUILT PLAN SHALL BE SUBMITTED TO THE ENGINEERING DIVISION BOTH DIGITAL FORMAT AND IN HARD COPY. THE PLAN MUST SHOW UTILITIES AND DRAINAGE (UTILIZING SWING TIES), ANY EASEMENTS AND FINAL GRADING.
7. IF ENGINEERING DIVISION ACCEPTANCE IS REQUESTED PRIOR TO ALL SITE WORK BEING COMPLETED, THE APPLICANT WILL BE REQUIRED TO POST A CERTIFIED BANK CHECK IN THE AMOUNT TO COVER THE REMAINING WORK. THE CITY ENGINEER SHALL DETERMINE THE VALUE OF THE UNCOMPLETED WORK.



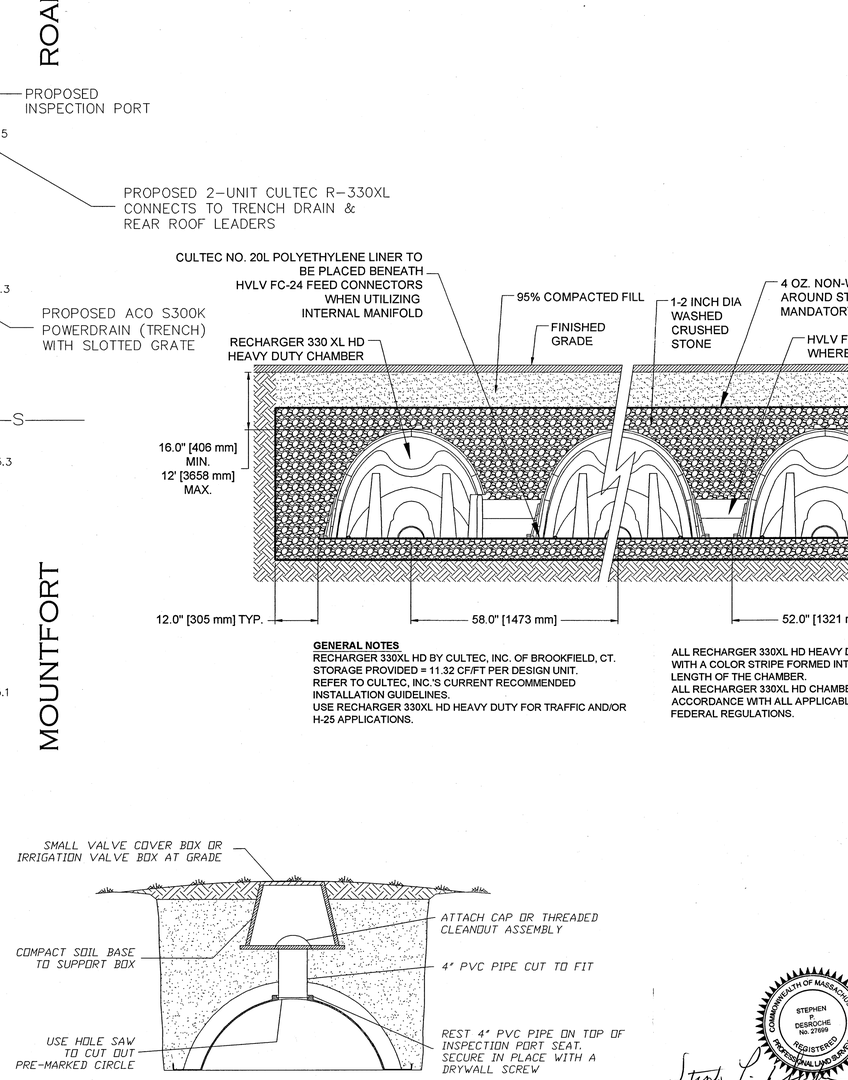
TRENCH DRAIN DETAIL
NOT TO SCALE



PRECAST CONCRETE
DRAIN MANHOLE W/ HOOD
NOT TO SCALE



ROOF LEADER DETAIL
NOT TO SCALE



GENERAL NOTES
RECHARGER 330XL HD BY CULTEC, INC. OF BROOKFIELD, CT.
STORAGE PROVIDED = 11.32 CF/FT PER DESIGN UNIT.
REFER TO CULTEC, INC.'S CURRENT RECOMMENDED INSTALLATION GUIDELINES.
USE RECHARGER 330XL HD HEAVY DUTY FOR TRAFFIC AND/OR H-25 APPLICATIONS.

ALL RECHARGER 330XL HD HEAVY DUTY UNITS ARE MARKED WITH A COLOR STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER.
ALL RECHARGER 330XL HD CHAMBERS MUST BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.

INSPECTION PORT DETAIL

COMMONWEALTH OF MASSACHUSETTS
SHAWN P. HARDY
NO. 41650
CIVIL
REGISTERED
PROFESSIONAL ENGINEER

COMMONWEALTH OF MASSACHUSETTS
STEPHEN P. DESROCHE
No. 27699
REGISTERED
PROFESSIONAL LAND SURVEYOR

STEPHEN P. DESROCHE PLS No. 27699

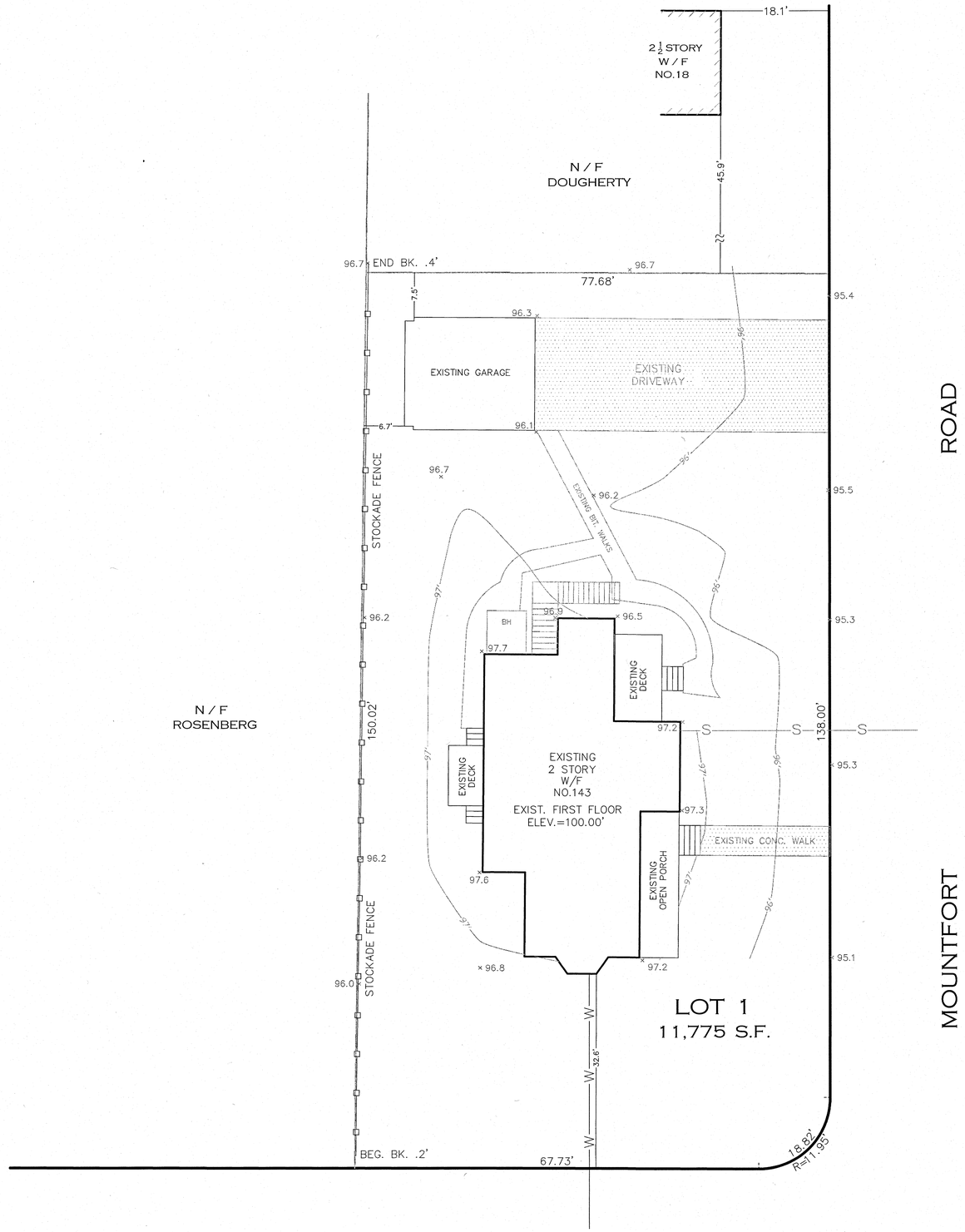
SITE PLAN
SHOWING
PROPOSED ADDITION
AT
143 LINCOLN STREET
IN
NEWTON, MASS.

PREPARED FOR:
ARMAN CHITCHIAN

PREPARED BY:
NEPONSET VALLEY SURVEY ASSOC., INC.
95 WHITE STREET
QUINCY, MA 02169

SCALE: 1"=10'
DATE: OCTOBER 10, 2014

JAH (11-0174)



0 5 10 20 30 40

TBM – EXISTING FIRST FLOOR=100.00' (ASSUMED)

SITE PLAN

SHOWING

EXISTING CONDITIONS

AT

143 LINCOLN STREET

IN

NEWTON, MASS.

PREPARED FOR:

ARMAN CHITCHIAN

PREPARED BY:

NEPONSET VALLEY SURVEY ASSOC., INC.
95 WHITE STREET
QUINCY, MA 02169

SCALE: 1"=10'

DATE: OCTOBER 15, 2014

COMMONWEALTH OF MASSACHUSETTS
STEPHEN P. DESROCHE No. 27699 REGISTERED PROFESSIONAL LAND SURVEYOR

STEPHEN P. DESROCHE PLS No. 27699

JMH (11-07D)

STORMWATER REPORT

For

143 Lincoln Street
Newton, MA

Prepared For:

Arman Chitchian

Prepared By:

Neponset Valley Survey Associates
95 White Street
Quincy, MA

October 14, 2014

The subject property is located at 143 Lincoln Street in Newton, Massachusetts. The current use is residential. The lot is approximately 11,775 square feet with an existing residential structure, paved driveway and a detached garage. The remainder of the lot is landscaped with a combination of grass and bushes/trees.

The Soil Survey of Norfolk Massachusetts indicates that the soils on the lot consist of 626B (Merrimac Urban Land Complex). Test pits confirm the presence of well drained medium sand with no visible water table to a depth of 110-inches.

In General, the existing site is a mound and drains unchecked and untreated to all lot lines. Proposed grades and drainage patterns are to match existing site grades with the exception of a driveway sloped to accommodate a proposed garage under.

The proposal involves constructing an addition to the existing residential structure, removing the garage to construct a car port and grading a new proposed driveway to accommodate a garage under as depicted on the proposed plans. In order to mitigate for the increase in impervious area, a cultic leaching chamber system is proposed. The proposed system has been sized to infiltrate the roof area from the rear portion of the addition as well as the driveway serving the garage under. The result is a reduction in off-site, post-construction runoff for all design storms.

The table below summarizes the pre and post development runoff from the site. Supporting materials including HydroCAD calculations and soil information have been attached to this report.

	Existing-Washington St		**Proposed-Washington St**	
	cfs	**AF**	**cfs**	**AF**
2- year	0.09	0.010	0.08	0.009
10-year	0.30	0.024	0.26	0.021
25-year	0.48	0.036	0.41	0.031
100-year	0.79	0.056	0.68	0.048

Soil Map—Middlesex County, Massachusetts
(143 Lincoln Street)

Map Scale: 1:1,240 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 14, Sep 19, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 30, 2011—May 1, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Middlesex County, Massachusetts (MA017)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	6.5	100.0%
Totals for Area of Interest		**6.5**	**100.0%**

Middlesex County, Massachusetts

626B—Merrimac-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9957
Elevation: 0 to 2,100 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Merrimac and similar soils: 40 percent
Urban land: 40 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Excavated and filled land

Description of Merrimac

Setting

Landform: Terraces, plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 18 inches: gravelly sandy loam
H3 - 18 to 26 inches: very gravelly loamy coarse sand
H4 - 26 to 33 inches: stratified extremely gravelly coarse sand
H5 - 33 to 65 inches: stratified gravelly coarse sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Minor Components

Sudbury

Percent of map unit: 10 percent
Landform: Terraces, plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave

Windsor

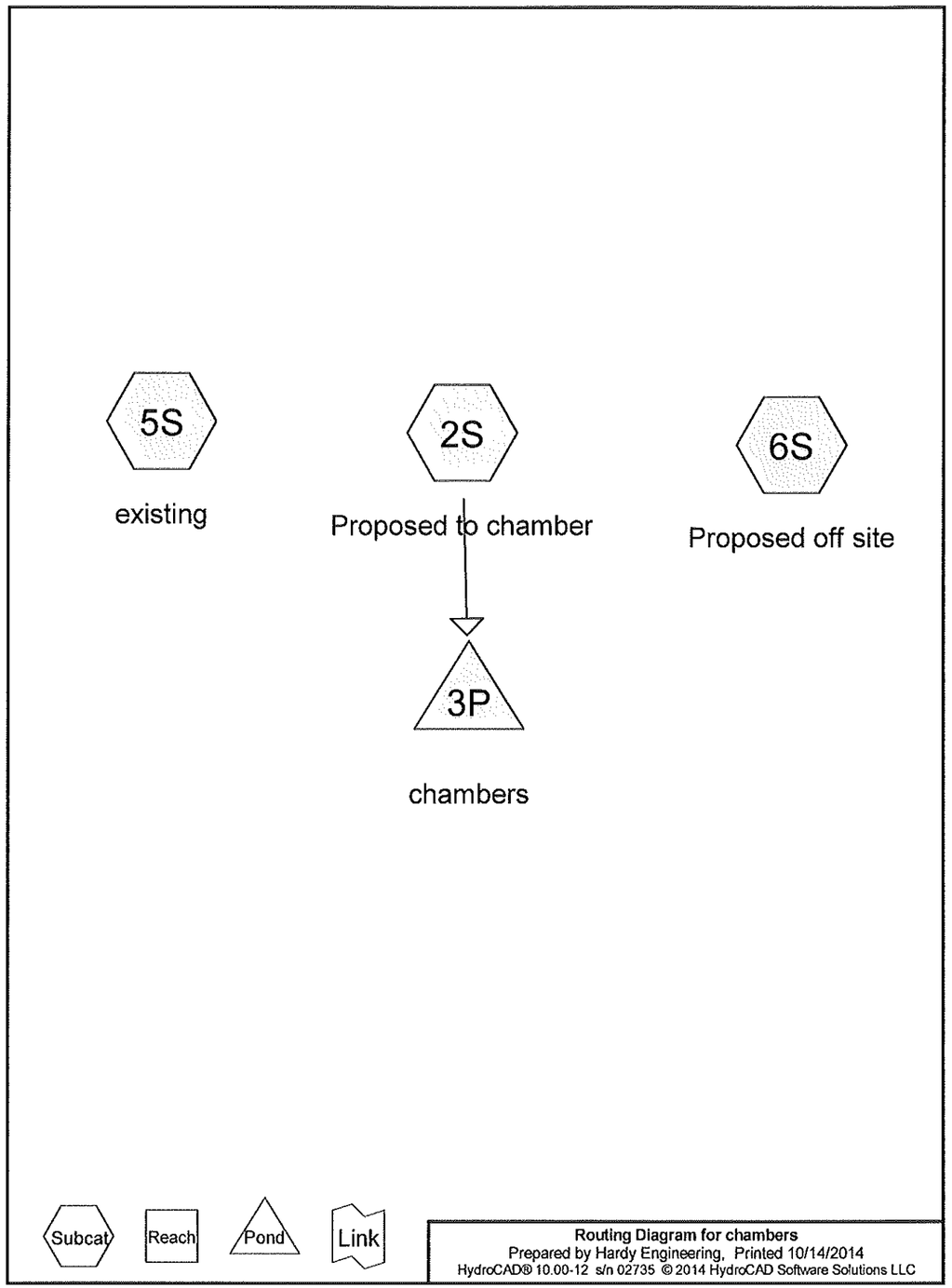
Percent of map unit: 5 percent
Landform: Deltas, terraces, flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex

Hinckley

Percent of map unit: 5 percent
Landform: Ridges, eskers, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 14, Sep 19, 2014


5S
existing
2S
Proposed to chamber
6S
Proposed off site
3P
chambers
Subcat
Reach
Pond
Link
Routing Diagram for chambers
Prepared by Hardy Engineering, Printed 10/14/2014
HydroCAD® 10.00-12 s/n 02735 © 2014 HydroCAD Software Solutions LLC

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: Proposed to chamber Runoff Area=1,718 sf 100.00% Impervious Runoff Depth=3.17"
Tc=5.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 5S: existing Runoff Area=11,775 sf 33.58% Impervious Runoff Depth=0.45"
Tc=5.0 min CN=59 Runoff=0.09 cfs 0.010 af

Subcatchment 6S: Proposed off site Runoff Area=10,057 sf 34.61% Impervious Runoff Depth=0.45"
Tc=5.0 min CN=59 Runoff=0.08 cfs 0.009 af

Pond 3P: chambers Peak Elev=89.07' Storage=71 cf Inflow=0.13 cfs 0.010 af
Outflow=0.04 cfs 0.010 af

Total Runoff Area = 0.541 ac Runoff Volume = 0.029 af Average Runoff Depth = 0.65"
61.13% Pervious = 0.331 ac 38.87% Impervious = 0.210 ac

Summary for Subcatchment 2S: Proposed to chamber

Runoff = 0.13 cfs @ 12.07 hrs, Volume= 0.010 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 year Rainfall=3.40"

	Area (sf)	CN	Description
*	1,130	98	roof
*	588	98	paved
	1,718	98	Weighted Average
	1,718		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 5S: existing

Runoff = 0.09 cfs @ 12.11 hrs, Volume= 0.010 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 year Rainfall=3.40"

	Area (sf)	CN	Description
	7,821	39	>75% Grass cover, Good, HSG A
*	3,954	98	impervious
	11,775	59	Weighted Average
	7,821		66.42% Pervious Area
	3,954		33.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min**

Summary for Subcatchment 6S: Proposed off site

Runoff = 0.08 cfs @ 12.11 hrs, Volume= 0.009 af, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 year Rainfall=3.40"

	Area (sf)	CN	Description
*	3,481	98	impervious
	6,576	39	>75% Grass cover, Good, HSG A
	10,057	59	Weighted Average
	6,576		65.39% Pervious Area
	3,481		34.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond 3P: chambers

Inflow Area = 0.039 ac,100.00% Impervious, Inflow Depth = 3.17" for 2 year event
Inflow = 0.13 cfs @ 12.07 hrs, Volume= 0.010 af
Outflow = 0.04 cfs @ 12.35 hrs, Volume= 0.010 af, Atten= 68%, Lag= 16.8 min
Discarded = 0.04 cfs @ 12.35 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 89.07' @ 12.35 hrs Surf.Area= 195 sf Storage= 71 cf

Plug-Flow detention time= 8.5 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time= 8.5 min (762.7 - 754.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.60'	145 cf	**11.17'W x 17.50'L x 3.04'H Field A** 594 cf Overall - 231 cf Embedded = 363 cf x 40.0% Voids
#2A	88.60'	231 cf	**Cultec R-330XLHD** x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		376 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.04 cfs @ 12.35 hrs HW=89.07' (Free Discharge)
↑**1=Exfiltration** (Controls 0.04 cfs)

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: Proposed to chamber Runoff Area=1,718 sf 100.00% Impervious Runoff Depth=4.46"
Tc=5.0 min CN=98 Runoff=0.19 cfs 0.015 af

Subcatchment 5S: existing Runoff Area=11,775 sf 33.58% Impervious Runoff Depth=1.07"
Tc=5.0 min CN=59 Runoff=0.30 cfs 0.024 af

Subcatchment 6S: Proposed off site Runoff Area=10,057 sf 34.61% Impervious Runoff Depth=1.07"
Tc=5.0 min CN=59 Runoff=0.26 cfs 0.021 af

Pond 3P: chambers Peak Elev=89.47' Storage=129 cf Inflow=0.19 cfs 0.015 af
Outflow=0.05 cfs 0.015 af

Total Runoff Area = 0.541 ac Runoff Volume = 0.059 af Average Runoff Depth = 1.32"
61.13% Pervious = 0.331 ac 38.87% Impervious = 0.210 ac

Summary for Subcatchment 2S: Proposed to chamber

Runoff = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
*	1,130	98	roof
*	588	98	paved
	1,718	98	Weighted Average
	1,718		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 5S: existing

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
	7,821	39	>75% Grass cover, Good, HSG A
*	3,954	98	impervious
	11,775	59	Weighted Average
	7,821		66.42% Pervious Area
	3,954		33.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min**

Summary for Subcatchment 6S: Proposed off site

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 year Rainfall=4.70"

	Area (sf)	CN	Description
*	3,481	98	impervious
	6,576	39	>75% Grass cover, Good, HSG A
	10,057	59	Weighted Average
	6,576		65.39% Pervious Area
	3,481		34.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond 3P: chambers

Inflow Area = 0.039 ac,100.00% Impervious, Inflow Depth = 4.46" for 10 year event
Inflow = 0.19 cfs @ 12.07 hrs, Volume= 0.015 af
Outflow = 0.05 cfs @ 12.42 hrs, Volume= 0.015 af, Atten= 75%, Lag= 21.2 min
Discarded = 0.05 cfs @ 12.42 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 89.47' @ 12.42 hrs Surf.Area= 195 sf Storage= 129 cf

Plug-Flow detention time= 14.6 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 14.6 min (762.7 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.60'	145 cf	**11.17'W x 17.50'L x 3.04'H Field A** 594 cf Overall - 231 cf Embedded = 363 cf x 40.0% Voids
#2A	88.60'	231 cf	**Cultec R-330XLHD** x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		376 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.05 cfs @ 12.42 hrs HW=89.47' (Free Discharge)
↑**1=Exfiltration** (Controls 0.05 cfs)

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: Proposed to chamber Runoff Area=1,718 sf 100.00% Impervious Runoff Depth=5.36"
Tc=5.0 min CN=98 Runoff=0.22 cfs 0.018 af

Subcatchment 5S: existing Runoff Area=11,775 sf 33.58% Impervious Runoff Depth=1.59"
Tc=5.0 min CN=59 Runoff=0.48 cfs 0.036 af

Subcatchment 6S: Proposed off site Runoff Area=10,057 sf 34.61% Impervious Runoff Depth=1.59"
Tc=5.0 min CN=59 Runoff=0.41 cfs 0.031 af

Pond 3P: chambers Peak Elev=89.76' Storage=172 cf Inflow=0.22 cfs 0.018 af
Outflow=0.05 cfs 0.018 af

Total Runoff Area = 0.541 ac Runoff Volume = 0.084 af Average Runoff Depth = 1.86"
61.13% Pervious = 0.331 ac 38.87% Impervious = 0.210 ac

Summary for Subcatchment 2S: Proposed to chamber

Runoff = 0.22 cfs @ 12.07 hrs, Volume= 0.018 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 year Rainfall=5.60"

	Area (sf)	CN	Description
*	1,130	98	roof
*	588	98	paved
	1,718	98	Weighted Average
	1,718		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 5S: existing

Runoff = 0.48 cfs @ 12.08 hrs, Volume= 0.036 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 year Rainfall=5.60"

	Area (sf)	CN	Description
	7,821	39	>75% Grass cover, Good, HSG A
*	3,954	98	impervious
	11,775	59	Weighted Average
	7,821		66.42% Pervious Area
	3,954		33.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min**

Summary for Subcatchment 6S: Proposed off site

Runoff = 0.41 cfs @ 12.08 hrs, Volume= 0.031 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 year Rainfall=5.60"

	Area (sf)	CN	Description
*	3,481	98	impervious
	6,576	39	>75% Grass cover, Good, HSG A
	10,057	59	Weighted Average
	6,576		65.39% Pervious Area
	3,481		34.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond 3P: chambers

Inflow Area = 0.039 ac,100.00% Impervious, Inflow Depth = 5.36" for 25 year event
Inflow = 0.22 cfs @ 12.07 hrs, Volume= 0.018 af
Outflow = 0.05 cfs @ 12.45 hrs, Volume= 0.018 af, Atten= 77%, Lag= 23.0 min
Discarded = 0.05 cfs @ 12.45 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 89.76' @ 12.45 hrs Surf.Area= 195 sf Storage= 172 cf

Plug-Flow detention time= 18.9 min calculated for 0.018 af (100% of inflow)
Center-of-Mass det. time= 18.9 min (764.2 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.60'	145 cf	**11.17'W x 17.50'L x 3.04'H Field A** 594 cf Overall - 231 cf Embedded = 363 cf x 40.0% Voids
#2A	88.60'	231 cf	**Cultec R-330XLHD** x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		376 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.05 cfs @ 12.45 hrs HW=89.76' (Free Discharge)
↑**1=Exfiltration** (Controls 0.05 cfs)

Time span=0.00-36.00 hrs, dt=0.02 hrs, 1801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: Proposed to chamber Runoff Area=1,718 sf 100.00% Impervious Runoff Depth=6.76"
Tc=5.0 min CN=98 Runoff=0.28 cfs 0.022 af

Subcatchment 5S: existing Runoff Area=11,775 sf 33.58% Impervious Runoff Depth=2.51"
Tc=5.0 min CN=59 Runoff=0.79 cfs 0.056 af

Subcatchment 6S: Proposed off site Runoff Area=10,057 sf 34.61% Impervious Runoff Depth=2.51"
Tc=5.0 min CN=59 Runoff=0.68 cfs 0.048 af

Pond 3P: chambers Peak Elev=90.25' Storage=240 cf Inflow=0.28 cfs 0.022 af
Outflow=0.06 cfs 0.022 af

Total Runoff Area = 0.541 ac Runoff Volume = 0.127 af Average Runoff Depth = 2.82"
61.13% Pervious = 0.331 ac 38.87% Impervious = 0.210 ac

Summary for Subcatchment 2S: Proposed to chamber

Runoff = 0.28 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr Newton Rainfall=7.00"

	Area (sf)	CN	Description
*	1,130	98	roof
*	588	98	paved
	1,718	98	Weighted Average
	1,718		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 5S: existing

Runoff = 0.79 cfs @ 12.08 hrs, Volume= 0.056 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr Newton Rainfall=7.00"

	Area (sf)	CN	Description
	7,821	39	>75% Grass cover, Good, HSG A
*	3,954	98	impervious
	11,775	59	Weighted Average
	7,821		66.42% Pervious Area
	3,954		33.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, min**

Summary for Subcatchment 6S: Proposed off site

Runoff = 0.68 cfs @ 12.08 hrs, Volume= 0.048 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Type III 24-hr Newton Rainfall=7.00"

	Area (sf)	CN	Description
*	3,481	98	impervious
	6,576	39	>75% Grass cover, Good, HSG A
	10,057	59	Weighted Average
	6,576		65.39% Pervious Area
	3,481		34.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Pond 3P: chambers

Inflow Area = 0.039 ac,100.00% Impervious, Inflow Depth = 6.76" for Newton event
Inflow = 0.28 cfs @ 12.07 hrs, Volume= 0.022 af
Outflow = 0.06 cfs @ 12.48 hrs, Volume= 0.022 af, Atten= 80%, Lag= 24.7 min
Discarded = 0.06 cfs @ 12.48 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.02 hrs
Peak Elev= 90.25' @ 12.48 hrs Surf.Area= 195 sf Storage= 240 cf

Plug-Flow detention time= 25.4 min calculated for 0.022 af (100% of inflow)
Center-of-Mass det. time= 25.4 min (767.4 - 742.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.60'	145 cf	**11.17'W x 17.50'L x 3.04'H Field A** 594 cf Overall - 231 cf Embedded = 363 cf x 40.0% Voids
#2A	88.60'	231 cf	**Cultec R-330XLHD** x 4 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		376 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	88.60'	**8.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.06 cfs @ 12.48 hrs HW=90.25' (Free Discharge)
↑**1=Exfiltration** (Controls 0.06 cfs)